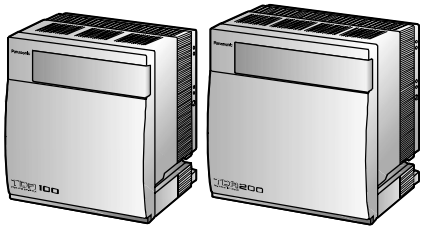
Panasonic

# Hybrid IP-PBX

# Installation Manual



Model KX-TDA100
KX-TDA200

Thank you for purchasing a Panasonic Hybrid IP-PBX.
Please read this manual carefully before using this product and save this manual for future use.

**KX-TDA100/KX-TDA200: Version 2.0**

SD Logo is
a trademark.

# System Components

**System Components Table**

| | Model | Description |
|---|---|---|
| **Shelves** | KX-TDA100 | Basic Shelf |
| | KX-TDA200 | Basic Shelf |
| **Main Processing Card** | | Main Processing Card (MPR) |
| **MPR Option Card** | KX-TDA0105 | Memory Expansion Card (MEC) |
| | KX-TDA0196 | Remote Card (RMT) |
| **CO Line Cards** | KX-TDA0180 | 8-Port Analog Trunk Card (LCOT8) |
| | KX-TDA0181 | 16-Port Analog Trunk Card (LCOT16) |
| | KX-TDA0187 | T-1 Trunk Card (T1) |
| | KX-TDA0193 | 8-Port Caller ID Card (CID8) |
| | KX-TDA0290 | PRI Card (PRI23) |
| | KX-TDA0480 | 4-Channel VoIP Gateway Card (IP-GW4) |
| | KX-TDA0484 | 4-Channel VoIP Gateway Card (IP-GW4E) |
| | KX-TDA0490 | 16-Channel VoIP Gateway Card (IP-GW16) |
| **Extension Cards** | KX-TDA0143 | 4 Cell Station Interface Card (CSIF4) |
| | KX-TDA0144 | 8 Cell Station Interface Card (CSIF8) |
| | KX-TDA0170 | 8-Port Digital Hybrid Extension Card (DHLC8) |
| | KX-TDA0171 | 8-Port Digital Extension Card (DLC8) |
| | KX-TDA0172 | 16-Port Digital Extension Card (DLC16) |
| | KX-TDA0173 | 8-Port Single Line Telephone Extension Card (SLC8) |
| | KX-TDA0174 | 16-Port Single Line Telephone Extension Card (SLC16) |
| | KX-TDA0175 | 16-Port Single Line Telephone Extension with Message Lamp Card (MSLC16) |
| | KX-TDA0470 | 16-Channel VoIP Extension Card (IP-EXT16) |
| **Other Cards** | KX-TDA0161 | 4-Port Doorphone Card (DPH4) |
| | KX-TDA0164 | 4-Port External Input/Output Card (EIO4) |
| | KX-TDA0166 | 16-Channel Echo Canceller Card (ECHO16) |
| | KX-TDA0168 | Extension Caller ID Card (EXT-CID) |
| | KX-TDA0190 | Optional 3-Slot Base Card (OPB3) |
| | KX-TDA0191 | 4-Channel Message Card (MSG4) |
| | KX-TDA0410 | CTI Link Card (CTI-LINK) |

**System Components Table**

| | Model | Description |
|---|---|---|
| **Optional SD Memory Card** | KX-TDA0920 | SD Memory Card for Software Upgrade to Enhanced Version |
| **Power Supply Units (PSUs)** | KX-TDA0103 | L-Type Power Supply Unit (PSU-L) |
| | KX-TDA0104 | M-Type Power Supply Unit (PSU-M) |
| | KX-TDA0108 | S-Type Power Supply Unit (PSU-S) |
| **Cell Stations (CSs)** | KX-TDA0142 | 3-Channel Cell Station Unit Using CSIF Card for 2.4 GHz Portable Station |
| | KX-T0141 | 2-Channel Cell Station Unit Using DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station |
| **Proprietary Equipment** | KX-A258 | Blank Slot Cover |
| | KX-T30865 | Doorphone |

**Available Proprietary Telephones**

The Hybrid IP-PBX supports all of the Panasonic KX-T7000, KX-TD7000, and KX-NT series:

- Digital/Analog/IP proprietary telephones (e.g., KX-T7625, KX-T7630, KX-T7633, KX-T7636, KX-NT136)
- Portable stations (e.g., KX-TD7690)
- DSS consoles (e.g., KX-T7640)

**Note**

The Hybrid IP-PBX does not support the following telephones:

- KX-T30800 series Proprietary Telephones and DSS consoles
- KX-T61600 series Proprietary Telephones and DSS consoles
- KX-T123200 series Proprietary Telephones and DSS consoles

For the equipment (e.g., Add-on Key Module, USB Module, Headset[*1]) that can be connected to a particular telephone, refer to the telephone's manual.

For other equipment that can be connected to the Hybrid IP-PBX, refer to "1.2.2 System Connection Diagram".

**Abbreviations in this manual**

Proprietary telephone: PT

Digital proprietary telephone: DPT

Analog proprietary telephone: APT

IP proprietary telephone: IP-PT

Portable station: PS

Single line telephone: SLT

**Notice**

The power supply capacity of the Hybrid IP-PBX may differ from the values described in this manual depending on the model number. Please consult your dealer for detailed information.

[*1] The KX-T7090 headset can be connected to the KX-T7000, KX-T7200, KX-T7300, and KX-T7400 series telephones.

# *Important Safety Instructions*

## SAFETY REQUIREMENTS

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or other heat source. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated only from the type of power source indicated on the product label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by people walking on it.
10. Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified person when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - **a)** When the power supply cord or plug is damaged or frayed.
    - **b)** If liquid has been spilled into the product.
    - **c)** If the product has been exposed to rain or water.
    - **d)** If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    - **e)** If the product has been dropped or the cabinet has been damaged.
    - **f)** If the product exhibits a distinct change in performance.
14. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

**15.** Do not use the telephone to report a gas leak in the vicinity of the leak.

## SAVE THESE INSTRUCTIONS

# *Precaution*

**WARNING**

**DO NOT REMOVE SD MEMORY CARD WHILE POWER IS SUPPLIED TO THE HYBRID IP-PBX**

**Doing so may cause the Hybrid IP-PBX to fail to start when you try to restart the system.**

- Keep the unit away from heating appliances and electrical noise generating devices such as fluorescent lamps, motors and televisions. These noise sources can interfere with the performance of the Hybrid IP-PBX.
- This unit should be kept free of dust, moisture, high temperature (more than 40 °C [104 °F]) and vibration, and should not be exposed to direct sunlight.
- Never attempt to insert wires, pins, etc. into the vents or other holes of this unit.
- If there is any trouble, disconnect the unit from the telephone line. Plug an SLT into the telephone line. If the telephone operates properly, do not reconnect the unit to the line until the trouble has been repaired by an authorized Panasonic Factory Service Centre. If the telephone does not operate properly, chances are that the trouble is in the telephone system, and not in the unit.
- Do not use benzene, thinner, or the like, or any abrasive powder to clean the cabinet. Wipe it with a soft cloth.

## WARNING

- **THIS UNIT MAY ONLY BE INSTALLED AND SERVICED BY QUALIFIED SERVICE PERSONNEL.**
- **WHEN A FAILURE OCCURS WHICH EXPOSES ANY INTERNAL PARTS, DISCONNECT THE POWER SUPPLY CORD IMMEDIATELY AND RETURN THIS UNIT TO YOUR DEALER.**
- **DISCONNECT THE TELECOM CONNECTION BEFORE DISCONNECTING THE POWER CONNECTION PRIOR TO RELOCATING THE EQUIPMENT, AND RECONNECT THE POWER FIRST.**
- **THIS UNIT IS EQUIPPED WITH A GROUNDING CONTACT PLUG. FOR SAFETY REASONS, THIS PLUG MUST ONLY BE CONNECTED TO A GROUNDING CONTACT SOCKET WHICH HAS BEEN INSTALLED ACCORDING TO REGULATIONS.**
- **TO PREVENT THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.**
- **THE POWER SUPPLY CORD IS USED AS THE MAIN DISCONNECT DEVICE. ENSURE THAT THE SOCKET-OUTLET IS LOCATED/INSTALLED NEAR THE EQUIPMENT AND IS EASILY ACCESSIBLE.**

## CAUTION

DANGER OF EXPLOSION EXISTS IF THE BATTERY IS INCORRECTLY REPLACED. REPLACE THE BATTERY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE BATTERY MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

## Password Security

***Warning to the Administrator or Installer regarding the system password***

1. Please provide all system passwords to the customer.
2. To avoid unauthorized access and possible abuse of the PBX, keep the passwords secret, and inform the customer of the importance of the passwords, and the possible dangers if they become known to others.
3. The PBX has default passwords preset. For security, change these passwords the first time that you program the PBX.
4. Change the passwords periodically.
5. It is strongly recommended that passwords of 10 numbers or characters be used for maximum protection against unauthorized access. For a list of numbers and characters that can be used in system passwords, refer to "3.1.3 Entering Characters" in the Feature Guide.
6. If a system password is forgotten, it can be found by loading a backup of the system data into a PC, and checking the password using the KX-TDA Maintenance Console software. If you do not have a backup of the system data, you must reset the PBX to its factory defaults and reprogram it. Therefore, we strongly recommend maintaining a backup of the system data. For more information on how to back up the system data, refer to the on-line help of the Maintenance Console. However, as system passwords can be extracted from backup copies of the system data file, do not allow unauthorized access to these files.

**When you ship the product**
Carefully pack and send it prepaid, adequately insured and preferably in the original carton. Attach a postage-paid letter, detailing the symptom, to the outside of the carton. DO NOT send the product to the Executive or Regional Sales offices. They are NOT equipped to make repairs.

**Product Service**
Panasonic Factory Servicenters for this product are listed in the servicenter directory. Consult your certified Panasonic dealer for detailed instructions.

The serial number of this product may be found on the label affixed to the side of the unit. You should note the model number and the serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid in identification in the event of theft.

MODEL No.: _____

SERIAL No.: _____

**For your future reference**

DATE OF PURCHASE _____

NAME OF DEALER _____

DEALER'S ADDRESS _____

_____

_____

_____

DEALER'S TEL. NO. _____

# Introduction

This Installation Manual is designed to serve as an overall technical reference for the Panasonic Hybrid IP-PBX, KX-TDA100/KX-TDA200. It provides instructions for installing the hardware, and programming the Hybrid IP-PBX using the KX-TDA Maintenance Console.

## The Structure of this Manual

This manual contains the following sections:

**Section 1 System Outline**

Provides general information on the Hybrid IP-PBX, including the system capacity and specifications.

**Section 2 Installation**

Describes the procedures to install the Hybrid IP-PBX. Detailed instructions for planning the installation site, installing the shelves and optional service cards, and cabling of peripheral equipment are provided. Further information on system expansion and peripheral equipment installation is included.

**Section 3 Guide for the KX-TDA Maintenance Console**

Explains the installation procedure, structure, and basic information of the KX-TDA Maintenance Console.

**Section 4 Troubleshooting**

Provides information on the Hybrid IP-PBX and telephone troubleshooting.

## About the Other Manuals

Along with this Installation Manual, the following manuals are available:

**Feature Guide**

Describes all basic, optional and programmable features of the Hybrid IP-PBX, and step-by-step instruction for performing system programming using a proprietary telephone or a personal computer (PC).

**User Manual**

Provides operating instructions for end users using a PT, SLT, PS, or DSS Console.

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# F.C.C. REQUIREMENTS AND RELEVANT INFORMATION

1. **Notification to the Telephone Company**

   This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the side of this equipment is a label that contains, among other information, a product identifier in the format US: ACJMF03AKX-TDA100. If requested, this number must be provided to the telephone company.

   Installation must be performed by a qualified professional installer. If required, provide the telephone company with the following technical information:

   - Telephone numbers to which the system will be connected
   - Make: Panasonic
   - Model: KX-TDA100 and KX-TDA200
   - Certification No.: found on the side of the unit
   - Ringer Equivalence No.: 0.3A
   - Facility Interface Code: 02LS2, 04DU9.BN/DN/1KN/1SN, METALLIC
   - Service Order Code: 9.0F, 6.0P
   - Required Network Interface Jack: RJ21X, RJ48C, RJ2HX

2. **Ringer Equivalence Number (REN)**

   The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US: ACJMF03AKX-TDA100. The digits represented by 03 are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

3. **Incidence of Harm to the Telephone Lines**

   If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

4. **Changes in Telephone Company Communications Facilities, Equipment, Operations and Procedures**

   The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

5. **Trouble with this equipment**

   If trouble is experienced with this equipment, for repair or warranty information, please see the attached warranty, which includes the Servicenter Directory. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

6. **Connection to Party Line**

   Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

7. **Combined Use with Alarm Equipment**

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

**Note**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## CAUTION

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

When programming emergency numbers and/or making test calls to emergency numbers:

1. Remain on the line and briefly explain to the dispatcher the reason for the call before hanging up.
2. Perform such activities in the off-peak hours, such as early morning hours or late evenings.

## WARNING

**The software contained in the ARS and TRS features to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service. Failure to upgrade the premises PBXs or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and to these codes.**
**KEEP THE SOFTWARE UP-TO-DATE WITH THE LATEST DATA.**

## For Cell Station

### CAUTION

Any changes or modifications not expressly approved by the party responsible for compliance could void user's authority to operate this device.

**Note**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Some wireless telephones operate at frequencies that may cause interference to nearby TVs and VCRs. To minimize or prevent such interference, the base of the wireless telephone should not be placed near or on top of a TV or VCR. If interference is experienced, move the wireless telephone further away from the TV or VCR. This will often reduce, or eliminate, interference.
Operating near 2.4 GHz electrical appliances may cause interference. Move away from the electrical appliances.

### CAUTION

To comply with FCC RF exposure requirements in uncontrolled environment:

- This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm (8 in) spacing must be provided between antenna and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

**Medical**—consult the manufacturer of any personal medical devices, such as pacemakers, to determine if they are adequately shielded from external RF (radio frequency) energy. (The unit operates in the frequency range of 2401 MHz to 2480 MHz, and the power output level can range from 0.004 W to 0.4 W.) Do not use the unit in health care facilities if any regulations posted in the area instruct you not to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF (radio frequency) energy.

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# Section 1
# System Outline

*This section provides general information on the Hybrid IP-PBX, including the system capacity and specifications.*

# 1.1 System Highlights

## 1.1.1 System Highlights

### Networking Features

The Hybrid IP-PBX supports the following private networking features:

**TIE Line Service**

PBXs can be connected via privately leased telephone lines forming a private network. These "TIE lines" provide a cost-effective way to route calls and communications, and are often used to connect corporate offices located in different cities.

**QSIG Support**

TIE line service can be used on a private network that implements the QSIG protocol (Q.931). QSIG offers TIE line service as well as advanced caller and called party identification features.

**Voice over Internet Protocol (VoIP) Network**

The Hybrid-IP PBX can be used on a private network which implements VoIP. On this type of network, information is sent over the private network in IP packets, which allows voice as well as data to be sent to other devices in the private network.

### Built-in Small Call Center Features

Extensions can form an incoming call distribution (ICD) group and be used as a small call center which can take advantage of several features, some of which are highlighted below.

**Queuing**

When all available extensions in an ICD group are busy, additional calls can be placed in a queue as they arrive. While calls are waiting in the queue, callers can hear background music (BGM), an outgoing message (OGM), etc.

**Log-in/Log-out**

Members of an ICD group can log-in to or log-out of a group manually. Group members can log-in at the beginning of a work shift, and log-out at the end of the day. While logged-in, ICD group members can be allotted a specified amount of time after completing a call during which new calls will not be received by their extensions, allowing them to finish any necessary paperwork before being eligible to receive new calls (Wrap-up).

**VIP Call**

The VIP Call feature is one method of making sure that calls from preferred customers or callers are answered quickly. When using VIP Call mode, ICD groups are assigned a priority, allowing calls in higher-priority groups to be answered before calls in lower-priority groups.

### Computer Telephony Integration (CTI) Features

Computers can be connected to the Hybrid-IP PBX to provide extension users with access to advanced features such as pop-up display of caller information, computer-based speed dialing, etc.

**PC Phone/PC Console**

These Panasonic CTI applications can be used on computers connected to each extension, providing their respective extension users with powerful and flexible call handling and display features.

### Third-Party CTI Applications

The Hybrid IP-PBX supports industry standard protocols, allowing third-party CTI applications to be integrated with the PBX and its extensions.

## Voice Mail Features

A Voice Processing System (VPS) can be connected to the Hybrid IP-PBX to provide Voice Mail (VM) and Automated Attendant (AA) services. A Panasonic VPS which supports DPT (Digital) Integration can be connected to the Hybrid IP-PBX effortlessly and with minimal setup required. Conventional DTMF (analog) voice mail systems, including those from other manufacturers, are also supported.

## Paralleled Telephone Features

By connecting telephones in parallel, you can increase the number of telephones connected to the PBX without adding additional extension cards.

### Parallel Mode

An SLT can be connected to an APT or DPT which is connected to a Super Hybrid Port of the PBX. The SLT shares the same extension number with the APT or DPT.

### EXtra Device Port (XDP) Mode

An SLT can be connected to a DPT which is connected to a Super Hybrid Port of the PBX. Unlike parallel mode, XDP mode allows each telephone to act as an independent extension with its own extension number.

### Digital XDP

A DPT can be connected to another DPT which is connected to a DPT port or a Super Hybrid Port of the PBX. Similarly to XDP mode, each DPT acts as an independent extension with its own extension number.

## Portable Station (PS) Features

A Panasonic PS can be used in place of a PT to provide wireless access to PBX features and call handling. When in Wireless XDP Parallel Mode, a PS can share an extension number with a wired telephone, allowing extension users to use their PSs when they are away from their desks to answer or make calls as if they were using their wired telephones.

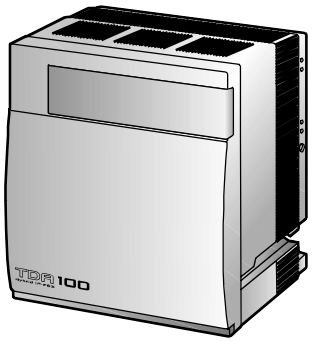
## Hospitality Features

This Hybrid IP-PBX has several features that support its use in a hotel-type environment. Extensions corresponding to guest rooms can be "checked in" or "checked out" by a designated hotel operator, who can also check or set wake-up calls.

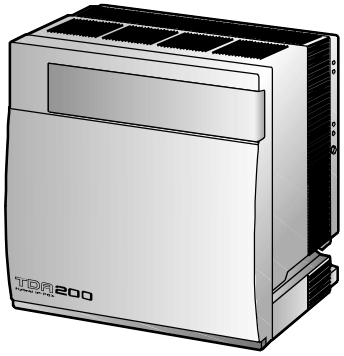
# 1.2 Basic System Construction

## 1.2.1 Basic Shelf

The basic shelf contains an MPR card. For system expansion, optional service cards and a power supply unit can be installed in the basic shelf.




KX-TDA100

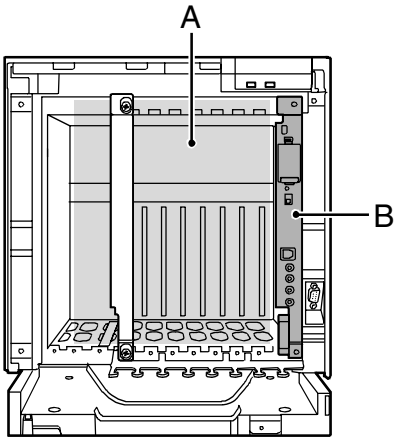


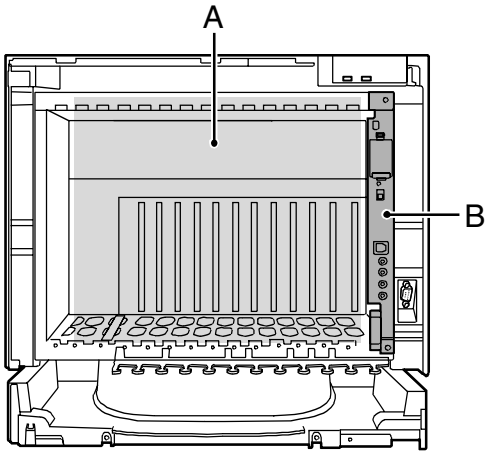

KX-TDA200

### Construction of Basic Shelf

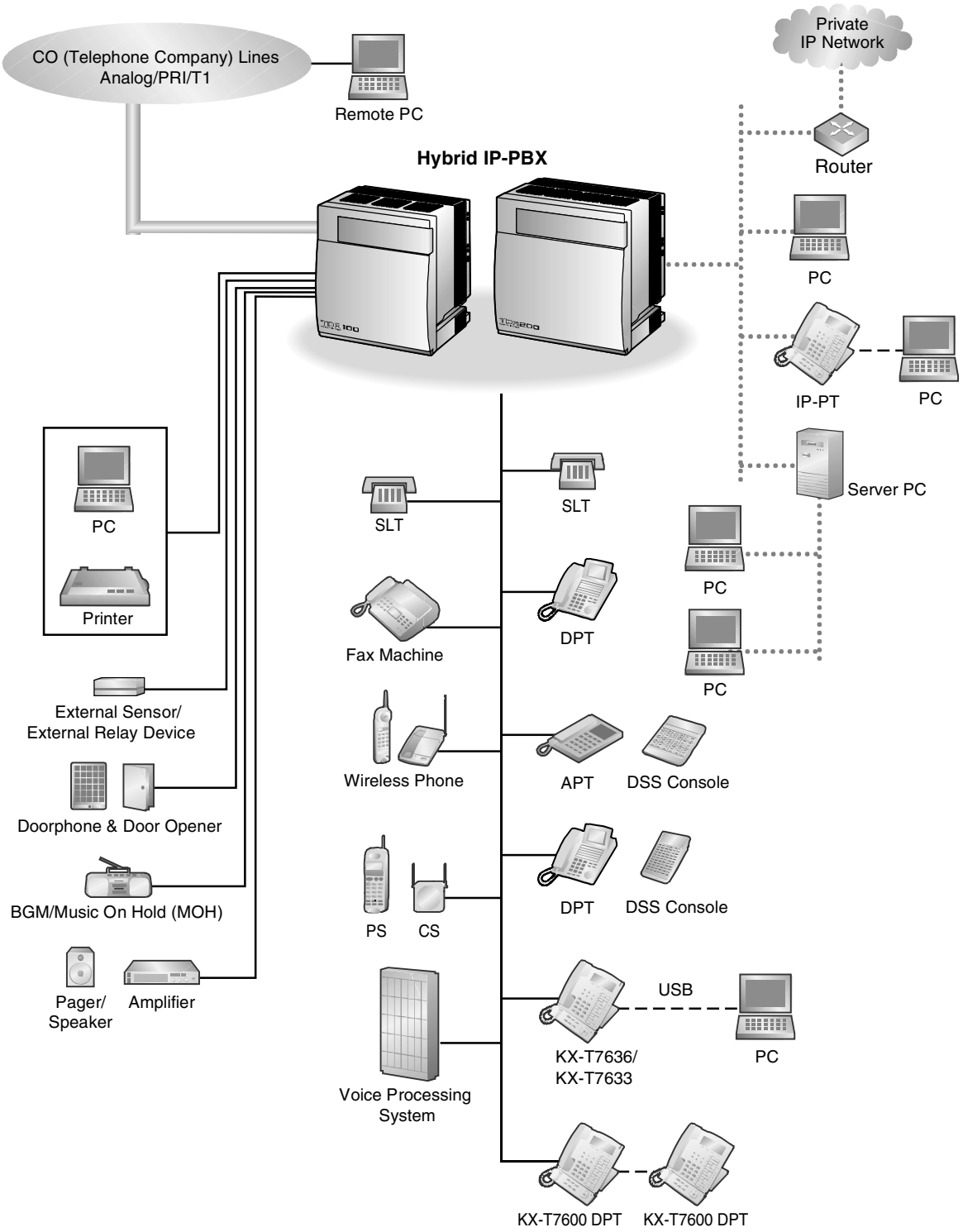
A: Slots for Expansion

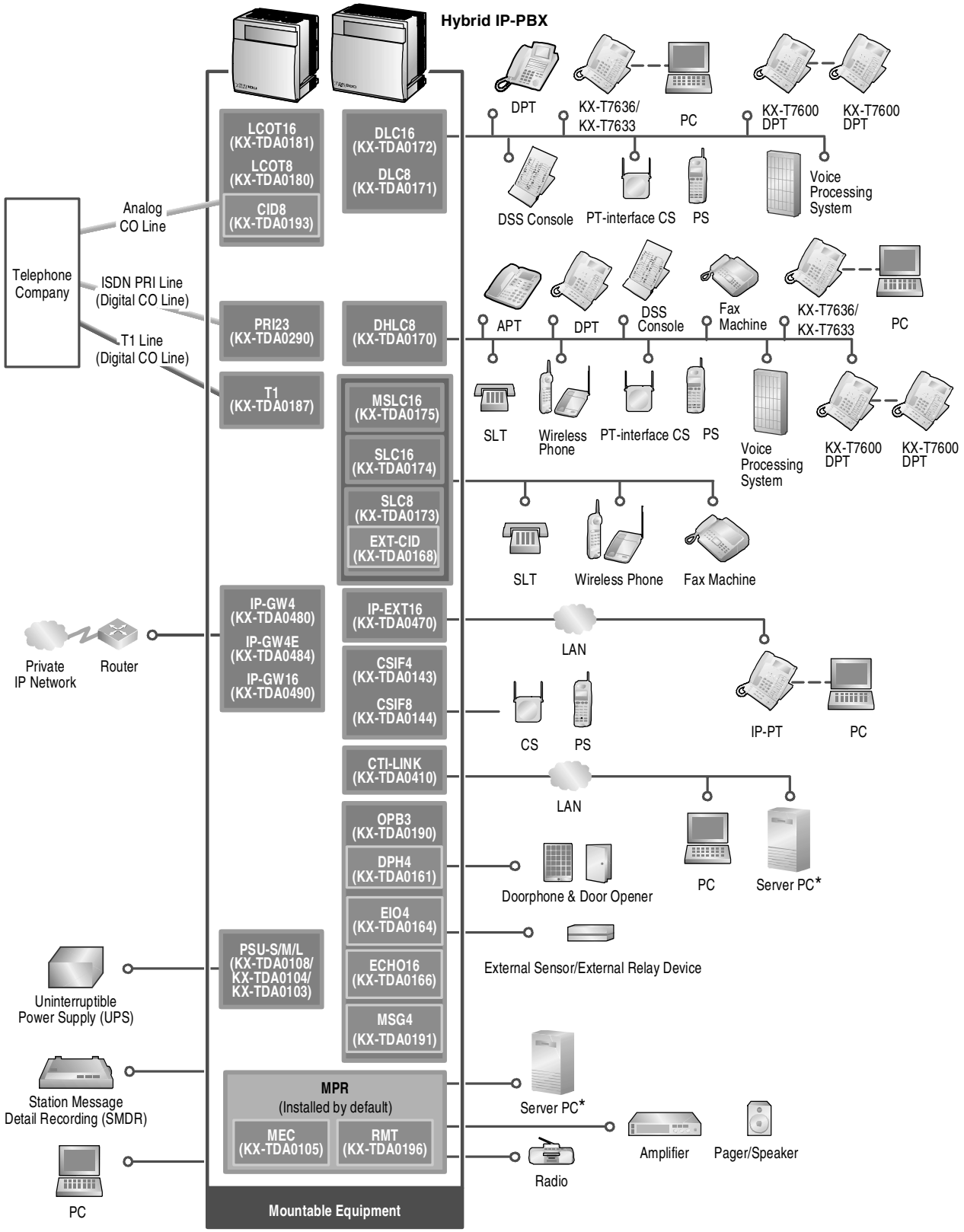
B: MPR Card



## 1.2.2 System Connection Diagram






* Only 1 Server PC can be connected to the Hybrid IP-PBX. Two or more Server PCs cannot be used simultaneously.

# 1.3 Options

## 1.3.1 Options

| Model No. | Model Name | Description |
|---|---|---|
| KX-TDA0105 | Memory Expansion Card (MEC) | Memory expansion card to increase system data storage space, enable Broadcasting feature, and double the number of DPTs, using Digital XDP connection. To be mounted on the MPR card. |
| KX-TDA0143 | 4 Cell Station Interface Card (CSIF4) | 4-port CS interface card for 4 CSs. |
| KX-TDA0144 | 8 Cell Station Interface Card (CSIF8) | 8-port CS interface card for 8 CSs. |
| KX-TDA0161 | 4-Port Doorphone Card (DPH4) | 4-port doorphone card for 4 doorphones and 4 door openers. To be mounted on the OPB3 card. |
| KX-TDA0164 | 4-Port External Input/Output Card (EIO4) | 4-port external input/output card. To be mounted on the OPB3 card. |
| KX-TDA0166 | 16-Channel Echo Canceller Card (ECHO16) | 16-channel card for echo cancellation during conferences. To be mounted on the OPB3 card. |
| KX-TDA0168 | Extension Caller ID Card (EXT-CID) | Sends Caller ID signals to extension ports. To be mounted on the SLC8 card. |
| KX-TDA0170 | 8-Port Digital Hybrid Extension Card (DHLC8) | 8-port digital hybrid extension card for DPTs, APTs, SLTs, DSS consoles, and PT-interface CSs, with 2 power failure transfer (PFT) ports. |
| KX-TDA0171 | 8-Port Digital Extension Card (DLC8) | 8-port digital extension card for DPTs, DSS consoles, and PT-interface CSs. |
| KX-TDA0172 | 16-Port Digital Extension Card (DLC16) | 16-port digital extension card for DPTs, DSS consoles, and PT-interface CSs. |
| KX-TDA0173 | 8-Port Single Line Telephone Extension Card (SLC8) | 8-port extension card for SLTs with 2 power failure transfer (PFT) ports. |
| KX-TDA0174 | 16-Port Single Line Telephone Extension Card (SLC16) | 16-port extension card for SLTs with 4 power failure transfer (PFT) ports. |
| KX-TDA0175 | 16-Port Single Line Telephone Extension with Message Lamp Card (MSLC16) | 16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum output of 145 V/85 V for Message Waiting Lamp control. |
| KX-TDA0180 | 8-Port Analog Trunk Card (LCOT8) | 8-port analog CO line card with 2 power failure transfer (PFT) ports. |
| KX-TDA0181 | 16-Port Analog Trunk Card (LCOT16) | 16-port analog CO line card with 4 power failure transfer (PFT) ports. |
| KX-TDA0187 | T-1 Trunk Card (T1) | 1-port T1 CO line card. EIA/TIA standard compliant. |

| Model No. | Model Name | Description |
|---|---|---|
| KX-TDA0190 | Optional 3-Slot Base Card (OPB3) | Optional 3-slot base card for mounting a maximum of 3 option cards from the following: MSG4, DPH4, or ECHO16 card. |
| KX-TDA0191 | 4-Channel Message Card (MSG4) | 4-channel message card. To be mounted on the OPB3 card. |
| KX-TDA0193 | 8-Port Caller ID Card (CID8) | 8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF. To be mounted on the LCOT8/LCOT16 cards. |
| KX-TDA0196 | Remote Card (RMT) | Analog modem card for remote communication with the Hybrid IP-PBX. ITU-T V.90 support. To be mounted on the MPR card. |
| KX-TDA0290 | PRI Card (PRI23) | 1-port ISDN Primary Rate Interface card (23B channels). NI (North American standard ISDN protocol) compliant. |
| KX-TDA0410 | CTI Link Card (CTI-LINK) | Ethernet card for CTI communication via 10BASE-T port. CSTA Phase 3 protocol compatible. |
| KX-TDA0470 | 16-Channel VoIP Extension Card (IP-EXT16) | 16-channel VoIP extension card. Compliant with Panasonic proprietary protocol, and ITU-T G.729a and G.711 CODEC methods. |
| KX-TDA0480 | 4-Channel VoIP Gateway Card (IP-GW4) | 4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, and G.723.1 CODEC methods. G3 fax support. |
| KX-TDA0484 | 4-Channel VoIP Gateway Card (IP-GW4E) | 4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, G.723.1, and G.711 CODEC methods. |
| KX-TDA0490 | 16-Channel VoIP Gateway Card (IP-GW16) | 16-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, G.723.1, and G.711 CODEC methods. |
| KX-TDA0103 | L-Type Power Supply Unit (PSU-L) | Power Supply Unit for KX-TDA200. Total power output of 279 W. Safety Class 1 compliant. |
| KX-TDA0104 | M-Type Power Supply Unit (PSU-M) | Power Supply Unit for KX-TDA100 and KX-TDA200. Total power output of 140.4 W. Safety Class 1 compliant. |
| KX-TDA0108 | S-Type Power Supply Unit (PSU-S) | Power Supply Unit for KX-TDA100. Total power output of 74 W. Safety Class 1 compliant. |
| KX-TDA0920 | SD Memory Card for Software Upgrade to Enhanced Version | Optional SD Memory Card to upgrade the Hybrid IP-PBX with software version 1 or 1.1 to version 2.0, and for NDSS feature and CTI enhancement. |

**Note**

For the maximum number of optional service cards that can be installed in the Hybrid IP-PBX, refer to "1.4.3 System Capacity".

# 1.4 Specifications

## 1.4.1 General Description

| | | |
|---|---|---|
| **Control Bus** | | Original bus (16-bit, 8 MHz, 10 megabytes per second) |
| **Communication Bus** | | H.100 bus conformity (1024 time slot) |
| **Switching** | | Non-blocking |
| **Power Input** | **PSU-S** | 100 V AC to 130 V AC, 1.4 A/200 V AC to 240 V AC, 0.8 A,<br>50 Hz/60 Hz |
| | **PSU-M** | 100 V AC to 130 V AC, 2.5 A/200 V AC to 240 V AC, 1.4 A,<br>50 Hz/60 Hz |
| | **PSU-L** | 100 V AC to 130 V AC, 5.1 A/200 V AC to 240 V AC, 2.55 A,<br>50 Hz/60 Hz |
| **Maximum Power Failure Tolerance**[*1] | | 300 ms |
| **Power Consumption** | **KX-TDA100 with PSU-S** | 140 W, 1.4 A (at 120 V AC, 60 Hz) |
| | **KX-TDA100 with PSU-M** | 210 W, 2.2 A (at 120 V AC, 60 Hz) |
| | **KX-TDA200 with PSU-M** | 240 W, 2.5 A (at 120 V AC, 60 Hz) |
| | **KX-TDA200 with PSU-L** | 490 W, 5.1 A (at 120 V AC, 60 Hz) |
| **Memory Backup Duration** | | 7 years |
| **Dialing** | **CO Line** | Dial Pulse (DP) 10 pps, 20 pps<br>Tone (DTMF) Dialing |
| | **Extension** | Dial Pulse (DP) 10 pps, 20 pps<br>Tone (DTMF) Dialing |
| **Mode Conversion** | | DP-DTMF, DTMF-DP |
| **Ring Frequency** | | 20 Hz/25 Hz (selectable) |
| **Central Office Loop Limit** | | 1600 Ω maximum |
| **Operating Environment** | **Temperature** | 0 °C to 40 °C (32 °F to 104 °F) |
| | **Humidity** | 10 % to 90 % (non-condensing) |
| **Conference Call CO Line** | | From 10 × 3-party conference call to 4 × 8-party conference call |
| **Music on Hold (MOH)** | | 2 ports (Level Control: -11 dB to +11 dB in 1 dB steps)<br>MOH1: External Music Source port<br>MOH2: Selectable Internal/External Music Source port |
| **Paging** | **Internal** | Level Control: -15 dB to +6 dB in 3 dB steps |
| | **External** | 2 ports (Volume Control: -15 dB to +15 dB in 1 dB steps) |

| | | | |
|---|---|---|---|
| **Serial Interface Port** | **RS-232C** | 1 (maximum 115.2 kbps) | |
| | **USB** | 1 | |
| **Extension Connection Cable** | | SLT | 1-pair wire (T, R) |
| | | DPT | 1-pair wire (D1, D2) or<br>2-pair wire (T, R, D1, D2) |
| | | APT | 2-pair wire (T, R, D1, D2) |
| | | PT-interface CS | 1-pair wire (D1, D2) |
| | | DSS Console and Add-on Key Module | 1-pair wire (D1, D2) |
| **Dimension** | **KX-TDA100** | 334 mm (W) × 390 mm (H) × 270 mm (D)<br>(13-1/3 in × 15-3/5 in × 10-4/5 in) | |
| | **KX-TDA200** | 430 mm (W) × 415 mm (H) × 270 mm (D)<br>(17-1/5 in × 16-3/5 in × 10-4/5 in) | |
| **Weight (when fully mounted)** | **KX-TDA100** | Under 12 kg (26.4 lb) | |
| | **KX-TDA200** | Under 16 kg (35.2 lb) | |

*1 If tolerance may be exceeded, an Uninterruptible Power Supply (UPS) is recommended.

## 1.4.2 Characteristics

| | |
|---|---|
| **Terminal Equipment Loop Limit** | • PT: KX-T7600 series: 90 Ω; all other DPTs/APTs: 40 Ω<br>• SLT: 600 Ω including set<br>• Doorphone: 20 Ω<br>• CS: 130 Ω; PT-interface CS: 65 Ω |
| **Minimum Leakage Resistance** | 15 000 Ω minimum |
| **Maximum Number of Extension Instruments per Line** | **1** for PT or SLT<br>**2** by Parallel or eXtra Device Port connection of an APT/DPT and an SLT<br>**3** by Digital eXtra Device Port connection of two DPTs and an SLT |
| **Ring Voltage** | 75 Vrms at 20 Hz/25 Hz depending on the Ringing Load |
| **Central Office Loop Limit** | 1600 Ω maximum |
| **Hookswitch Flash Timing Range** | 24 ms to 2032 ms |
| **Door Opener Current Limit** | 24 V DC/30 V AC, 1 A maximum |
| **External Relay Current Limit** | 24 V DC/30 V AC, 1 A maximum |
| **External Sensor Current Limit** | Power to the external sensor is provided from the EIO4 card and must be grounded through the EIO4 card. For the connection diagram, refer to "2.6.3 EIO4 Card". The Hybrid IP-PBX detects input from the sensor when the signal is under 100 Ω. |
| **Paging Terminal Impedance** | 600 Ω |
| **MOH (Music on Hold) Terminal Impedance** | 10 000 Ω |

# 1.4.3 System Capacity

## Maximum Optional Service Cards

There are 2 types of optional service cards for installation:

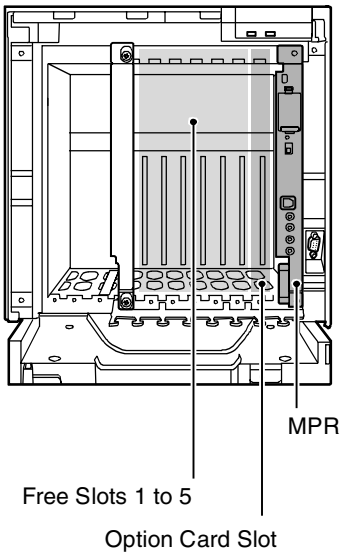
- Cards installed in the slots of the Hybrid IP-PBX
- Cards mounted on other optional service cards

**Notes**

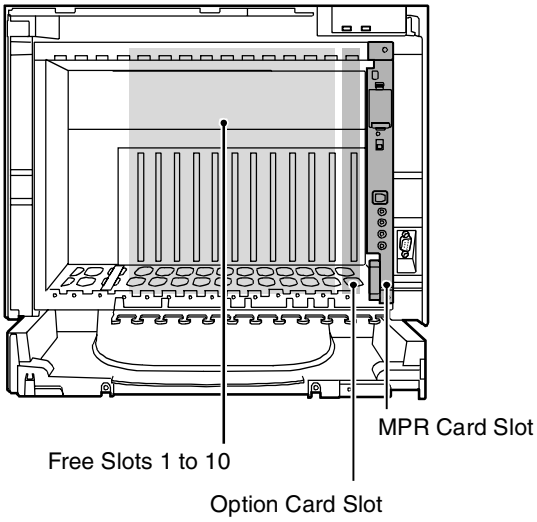
- Any card that exceeds the capacity of the Hybrid IP-PBX will be ignored.
- When the Hybrid IP-PBX starts up with an invalid configuration, some cards will be ignored.

### Cards Installed in the Slots of the Hybrid IP-PBX

**KX-TDA100**




**KX-TDA200**



The following number of optional service cards can be installed in the various slots of the Hybrid IP-PBX.

<table>
<tr><th colspan="2" rowspan="2">Card Type</th><th colspan="2">Maximum Number</th><th rowspan="2">Installed in</th></tr>
<tr><th>KX-TDA100</th><th>KX-TDA200</th></tr>
<tr><td colspan="2">MPR</td><td>1</td><td>1</td><td>MPR Card Slot</td></tr>
<tr><td colspan="2">Trunk Card</td><td>Total 4[*1]</td><td>Total 8[*1]</td><td rowspan="15">Free Slot</td></tr>
<tr><td rowspan="3">LCOT4<br>LCOT8<br>LCOT16</td><td rowspan="3">4</td><td rowspan="3">8</td></tr>
<tr><td rowspan="2">T1<br>PRI23</td><td rowspan="2">2</td><td rowspan="2">4</td></tr>
<tr><td rowspan="3">IP-GW4<br>IP-GW4E<br>IP-GW16</td><td rowspan="3">2</td><td rowspan="3">4</td></tr>
<tr><td colspan="2">Extension Card</td><td>Total 4</td><td>Total 8</td></tr>
<tr><td rowspan="8">DHLC8<br>DLC8<br>DLC16<br>SLC8<br>SLC16<br>MSLC16<br>IP-EXT16</td><td rowspan="8">4</td><td rowspan="8">8</td></tr>
<tr><td rowspan="2">CSIF4<br>CSIF8</td><td rowspan="2">2</td><td rowspan="2">4</td></tr>
<tr><td colspan="2">OPB3</td><td>2</td><td>4</td><td rowspan="2">Option Card Slot/Free Slot</td></tr>
<tr><td colspan="2">CTI-LINK</td><td>1</td><td>1</td></tr>
</table>

[*1] One T1, PRI23, or IP-GW4 card counts as 2 cards. However, one IP-GW4E card counts as 1 card.

### Cards Mounted on Other Optional Service Cards

The following number of optional service cards can be mounted on the specified other optional service cards.

| Card Type | Maximum Number | | Mounted on |
|---|---|---|---|
| | KX-TDA100 | KX-TDA200 | |
| MEC | 1 | 1 | MPR Card |
| RMT | 1 | 1 | |
| CID8 | 8 | 16 | LCOT8 Card/LCOT16 Card |
| EXT-CID | 4 | 8 | SLC8 Card |
| DPH4 | 2 | 4 | OPB3 Card |
| ECHO16 | 2*1 | 4*1 | |
| MSG4 | 2 | 4 | |
| EIO4 | 2 | 4 | |

*1 Only 1 ECHO16 card can be mounted on each OPB3 card.

## Maximum Terminal Equipment

The following number of items of terminal equipment can be supported by the Hybrid IP-PBX. For how to count the total number of items of equipment to be connected, refer to "MEC Card Calculation".

| Terminal Equipment Type | KX-TDA100 | | KX-TDA200 | |
|---|---|---|---|---|
| | Without MEC Card | With MEC Card | Without MEC Card | With MEC Card |
| Telephone*1 | 88 | 152 | 176 | 304 |
| SLT, APT, DPT and IP-PT | 64 | 128 | 128 | 256 |
| SLT | 64 | 64 | 128 | 128 |
| KX-T7600 series DPT | 64 | 128 | 128 | 256 |
| Other DPT | 64 | 64 | 128 | 128 |
| APT | 32 | 32 | 64 | 64 |
| IP-PT | 64 | 64 | 128 | 128 |
| DSS console | 8 | | 8 | |
| CS | 16 | | 32 | |
| PS | 128 | | 128 | |
| Voice Processing System (VPS) | 2 | | 2 | |
| Doorphone | 8 | | 16 | |
| Door Opener | 8 | | 16 | |

| Terminal Equipment Type | KX-TDA100 | | KX-TDA200 | |
|---|---|---|---|---|
| | Without MEC Card | With MEC Card | Without MEC Card | With MEC Card |
| External Sensor | 8 | | 16 | |
| External Relay | 8 | | 16 | |
| Add-on Key Module | 64 | 128 | 128 | 256 |
| USB Module | 64 | | 128 | |

*1 A single "T1-OPX (Off Premise Extension) port" is counted as a wired telephone.

## MEC Card Calculation

Calculate the MEC figure from the type and total number of items of equipment to be connected. If the MEC figure exceeds 64 (for KX-TDA100) or 128 (for KX-TDA200), you need to install an MEC card.

### MEC Card Calculation

| Equipment Type | | MEC Figure |
|---|---|---|
| PT | KX-T7600 series DPT/DSS console | 1 |
| | Other DPT/DSS console | 1 |
| | APT | 1 |
| | IP-PT | 1 |
| Extension Card*1 | DHLC8 | 8 |
| | SLC8 | 8 |
| | SLC16 | 16 |
| | MSLC16 | 16 |
| CS (1 unit) | | 0 |
| PT-interface CS (1 unit) | | 0 |
| VPS (1 port) | | 1 |

*1 Only the extension cards that can support SLTs count for the MEC figures.

### Calculation Example (KX-TDA100)

| Equipment Type | | MEC Figure |
|---|---|---|
| KX-T7600 series DPT | 48 units | 48 |
| SLC16 | 1 card | 16 |
| MSLC16 | 1 card | 16 |
| VPS | 8 ports | 8 |
| Total | | 88 |

The total MEC figure is 88. As this exceeds 64, you need to install an MEC card for this configuration.

# Power Supply Unit Selection

Hybrid IP-PBX needs an optional power supply unit (PSU) suitable for its configuration. Calculate the load figure from the type and number of items of equipment to be connected, and determine the type of PSU that will be required.

## Load Figure Calculation

| Equipment Type | | Load Figure |
|---|---|---|
| PT | KX-T7600 series DPT/DSS console | 1 |
| | Other DPT/DSS console | 4 |
| | APT | 4 |
| | IP-PT | 0 |
| Extension Card*1 | DHLC8 | 8 |
| | SLC8 | 8 |
| | SLC16 | 16 |
| | MSLC16 | 16 |
| CS (1 unit) | | 4 |
| PT-interface CS (1 unit) | | 4 |
| VPS (1 port) | | 1 |

*1 Only the extension cards that can support SLTs count for the load figures.

## PSU Capability

Each PSU supports a different amount of load figures.

| PSU Type | Maximum Load Figures |
|---|---|
| PSU-S*1 | 64 |
| PSU-M*2 | 128 |
| PSU-L*3 | 512 |

*1 Available for the KX-TDA100
*2 Available for the KX-TDA100 and KX-TDA200
*3 Available for the KX-TDA200

## Calculation Example (KX-TDA200)

| Equipment Type | | Load Figure |
|---|---|---|
| KX-T7600 series DPT | 48 units | 48 |
| Other DPT | 2 units | 8 |
| SLC16 | 1 card | 16 |
| MSLC16 | 1 card | 16 |
| VPS | 8 ports | 8 |

| Equipment Type | Load Figure |
|---|---|
| Total | 96 |

The total load figure is 96. As this is between 64 and 128, you should install the PSU-M. However, if you expect expansion in the future, it may be better to install the PSU-L. There is no harm in installing a PSU that is larger than is required for the current configuration.

# Section 2
# Installation

*This section describes the procedures to install the Hybrid IP-PBX. Detailed instructions for planning the installation site, installing the shelves and optional service cards, and cabling of peripheral equipment are provided. Further information on system expansion and peripheral equipment installation is included.*

# 2.1 Before Installation

## 2.1.1 Before Installation

Please read the following notes concerning installation and connection before installing the Hybrid IP-PBX. Be sure to comply with applicable local regulations (e.g., law, guidelines).

### Safety Installation Instructions

When installing telephone wiring, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.
5. Anti-static precautions should be taken during installation.

### Installation Precautions

This set is made for wall mounting (KX-TDA100/KX-TDA200) or floor standing (KX-TDA200 only). Avoid installing in the following places. (Doing so may result in malfunction, noise, or discoloration.)

1. In direct sunlight and hot, cold, or humid places.
   Temperature range: 0 °C to 40 °C (32 °F to 104 °F)
2. Sulphuric gases produced in areas where there are thermal springs, etc. may damage the equipment or contacts.
3. Places in which shocks or vibrations are frequent or strong.
4. Dusty places, or places where water or oil may come into contact with the unit.
5. Near high-frequency generating devices such as sewing machines or electric welders.
6. On or near computers, telexes, or other office equipment, as well as microwave ovens or air conditioners. (It is preferable not to install in the same room with the above equipment.)
7. Closer than 1.8 m (6 ft) to radios and televisions (both the Hybrid IP-PBX and PTs).
8. Do not obstruct the area around the Hybrid IP-PBX (for reasons of maintenance and inspection—be especially careful to allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the Hybrid IP-PBX for cooling).
9. Do not block the openings at top of the Hybrid IP-PBX.
10. Do not stack up the optional service cards.

### Wiring Precautions

Be sure to follow these instructions when wiring.

1. Do not wire the telephone cable in parallel with an AC power source, computer, telex, etc. If the cables are run near those wires, shield the cables with metal tubing or use shielded cables and ground the shields.
2. If cables are run on the floor, use protectors to prevent the wires from being stepped on. Avoid wiring under carpets.

3. Avoid using the same power supply outlet for computers, telexes, and other office equipment. Otherwise, Hybrid IP-PBX operation may be interrupted by the induction noise from such equipment.
4. Please use 1-pair telephone wire for extension connection of (telephone) equipment such as standard telephones, data terminals, answering machines, computers, Voice Processing Systems, etc., except PTs (e.g., KX-T7600 series).
5. The power switch of the Hybrid IP-PBX must be off during wiring. After the wiring is completed, turn the power switch on.
6. Mis-wiring may cause the Hybrid IP-PBX to operate improperly.
7. If an extension does not operate properly, disconnect the telephone from the extension line and then connect again, or turn the power to the Hybrid IP-PBX off and on again.
8. The Hybrid IP-PBX is equipped with a 3-wire grounding type plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
9. Use twisted pair cable for CO line connection.
10. CO lines should be installed with surge protectors. For details, refer to "2.2.13 Surge Protector Installation".
11. To assure good quality telephone connection, it is recommended new and modifications to existing installation of customer premise wiring shall use solid twisted pair copper conductors with minimum 24 gauge that comply with the electrical specifications for Category 3 wiring as detailed in ANSI/EIA/TIA-570A Building Wiring Standards.

# 2.2 Installation of the Hybrid IP-PBX

## 2.2.1 Unpacking

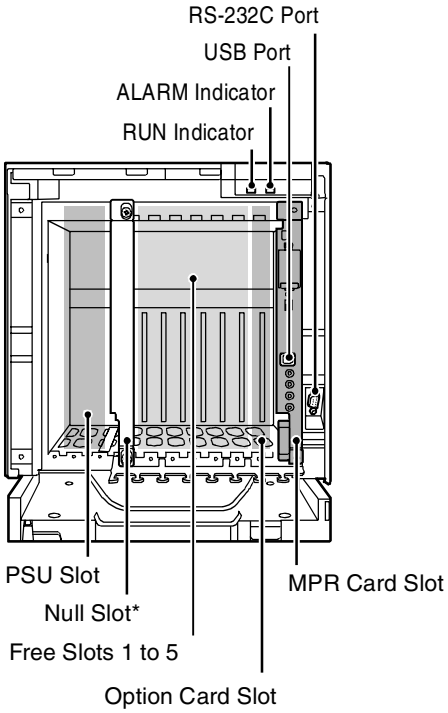
Unpack the box and check the items below:

| | KX-TDA100 | KX-TDA200 |
|---|---|---|
| Main Unit | 1 | 1 |
| Metal Bracket | 1 | 1 |
| Screw A | 3 | 4 |
| Screw B (Black) | 2 | 6 |
| Anchor Plug | 3 | 4 |
| Mini Plug (for pager and music source) | 4 | 4 |
| SD Memory Card | 1 | 1 |

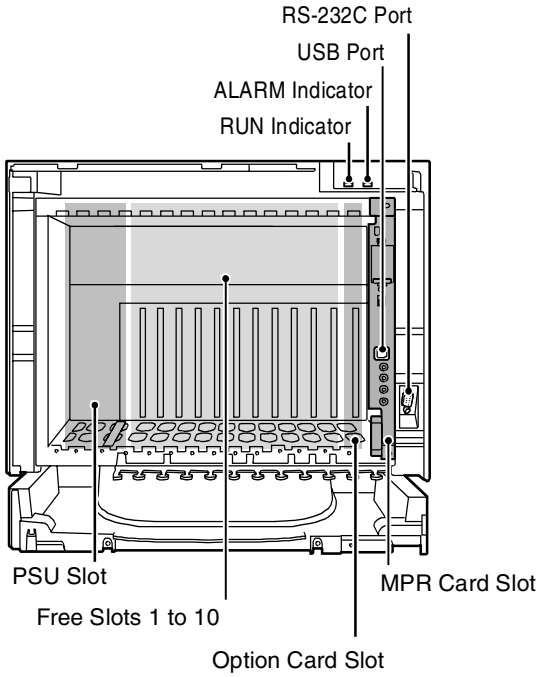
# 2.2.2 Names and Locations

## Inside View

### KX-TDA100




### KX-TDA200



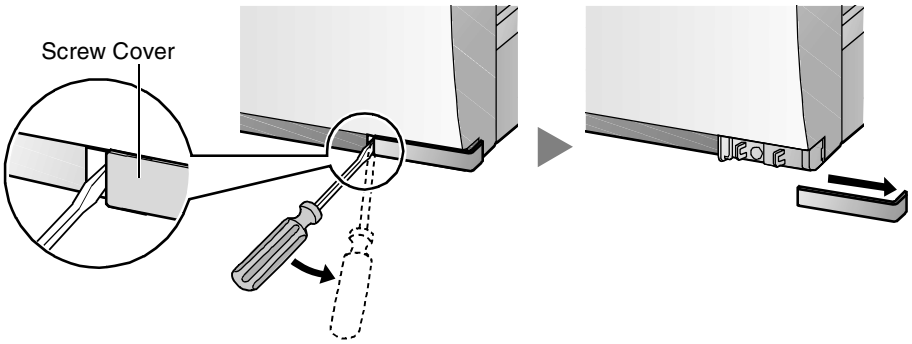

**Note**

* Null slot is not available for any optional service card.

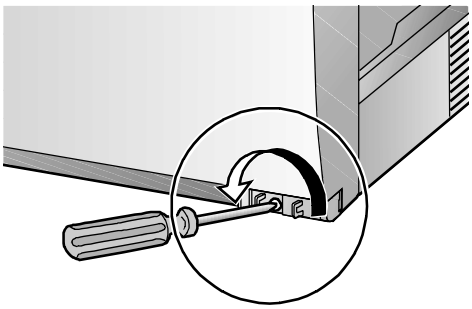
# 2.2.3 Opening/Closing the Front Cover

## Opening the Front Cover

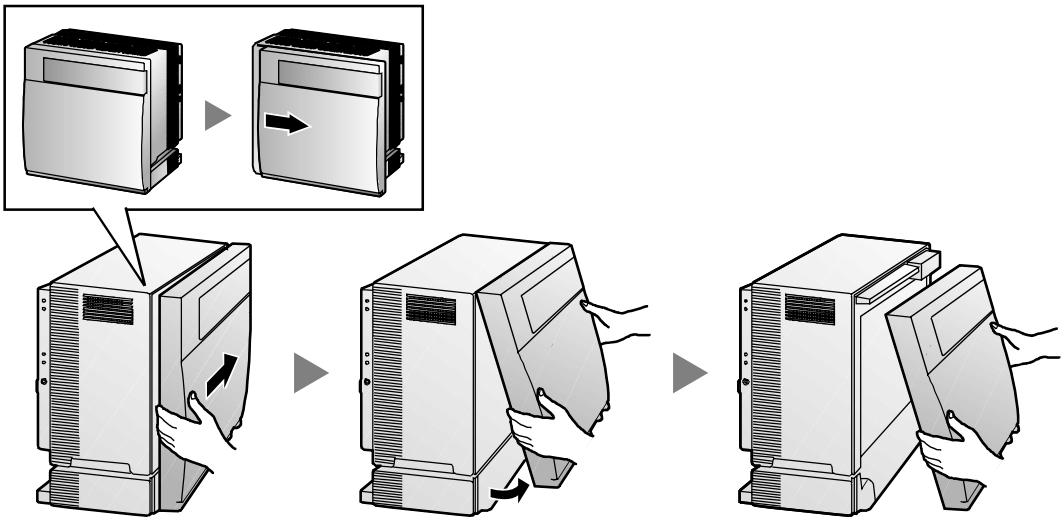
1. Insert a flathead screwdriver into the opening (on the left of the screw cover) and unlatch the screw cover.




2. Turn the screw counterclockwise to loosen.

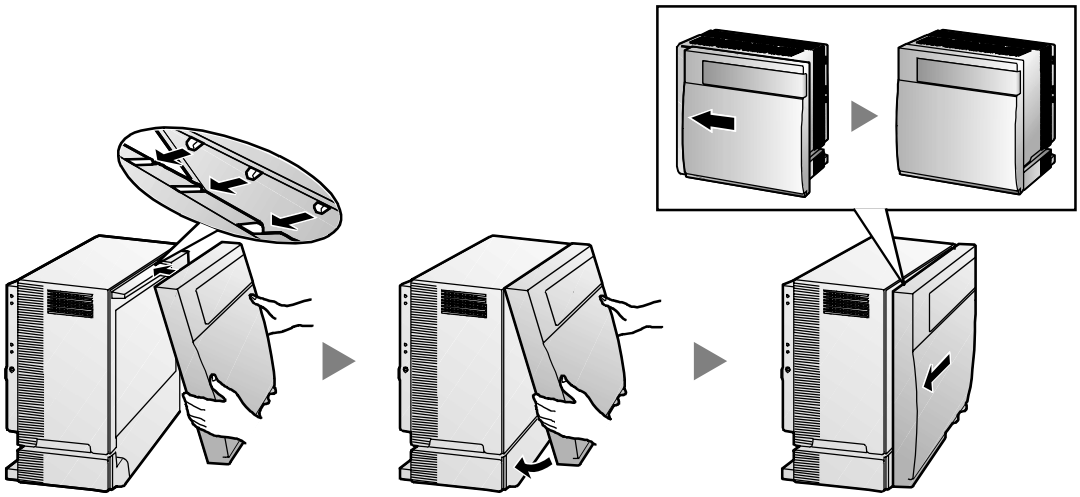


3. Slide the front cover to the right until it stops, then lift the front cover.

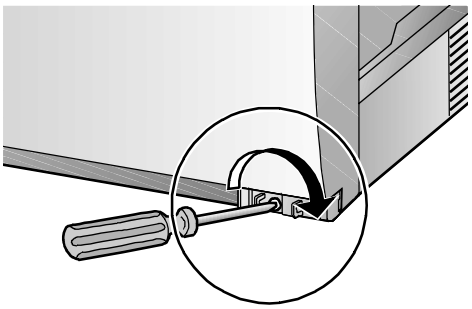


## Closing the Front Cover

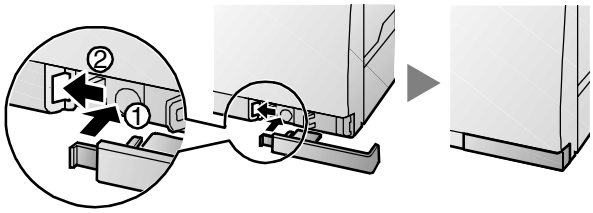
1. Hook the front cover onto the cabinet (line up the protrusions on the cover with the receptacles on the cabinet). Then slide the front cover to the left until it locks.



2. Turn the screw clockwise to tighten.



3. Secure the screw cover.



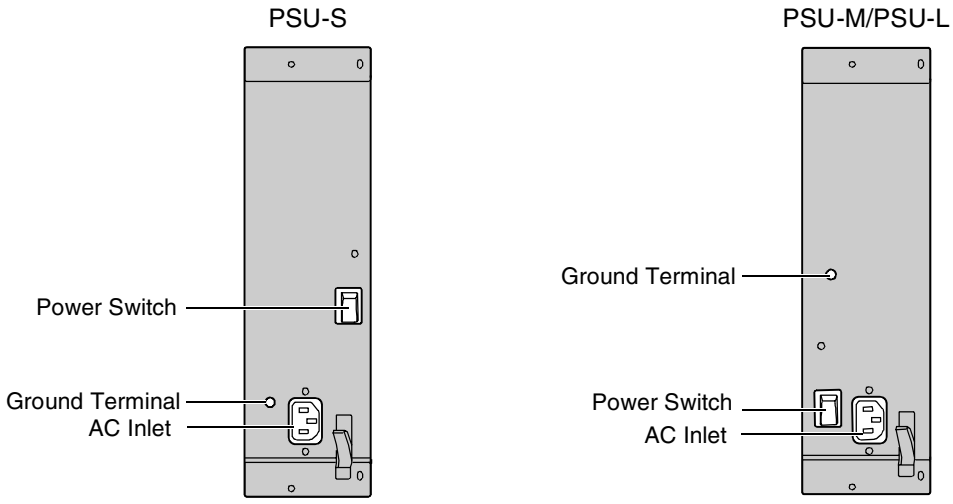

**Notes**

- For safety reasons, close the front cover and tighten the screw when the Hybrid IP-PBX is in operation.
- Do not forget to tighten the screw before securing the screw cover.

# 2.2.4 Installing/Replacing the Power Supply Unit

## Function

| PSU Type | Lower/Upper Input Voltage Range | Current | Input Frequency |
|---|---|---|---|
| **PSU-S** (for KX-TDA100) | Lower: 100 V AC to 130 V AC | 1.4 A | 50 Hz or 60 Hz |
| | Upper: 200 V AC to 240 V AC | 0.8 A | |
| **PSU-M** (for KX-TDA100/200) | Lower: 100 V AC to 130 V AC | 2.5 A | |
| | Upper: 200 V AC to 240 V AC | 1.4 A | |
| **PSU-L** (for KX-TDA200) | Lower: 100 V AC to 130 V AC | 5.1 A | |
| | Upper: 200 V AC to 240 V AC | 2.55 A | |




### Accessory and User-supplied Items

**Accessory (included):** Screws × 4, AC power cord × 1

**User-supplied (not included):** grounding wire

**Note**

For details about frame ground connection, refer to "2.2.5 Frame Ground Connection".

### Safety Instructions

Each PSU complies with Safety Class 1 of IEC60950, EN60950, UL60950, CAN/CSA-C22.2 No.60950, and AS/NZS60950; therefore a protective earth connection exists between the mains outlet ground and the PSU case. To ensure the PBX chassis is safely grounded, it is essential that the PSU case be securely fastened to the PBX chassis with the 4 screws provided with each PSU.

When installing or replacing PSU, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

1. Never install or replace PSU during a lightning storm.
2. Never install or replace PSU in wet locations.
3. Never install or replace PSU unless at least 20 s has elapsed after the AC supply is disconnected.

4. To protect the back board from static electricity, do not touch parts on the back board in the main unit and PSU. To discharge static electricity, touch ground or wear a grounding strap.

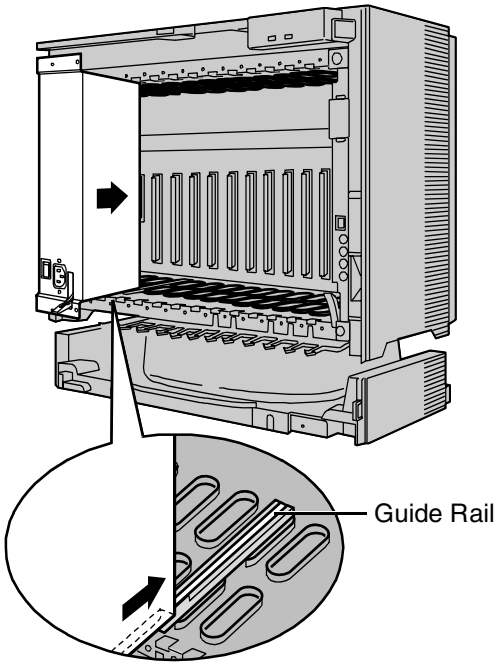
**The following procedures are for installing or replacing a PSU only. Do not replace or remove the PSU for any other purpose.**

## Installing the Power Supply Unit

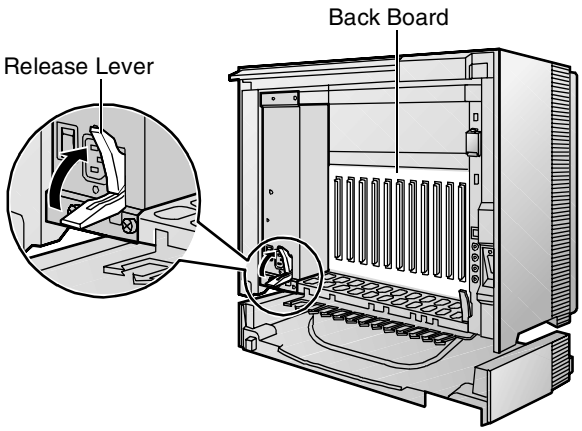
1. Insert the PSU along the guide rails.

**CAUTION**

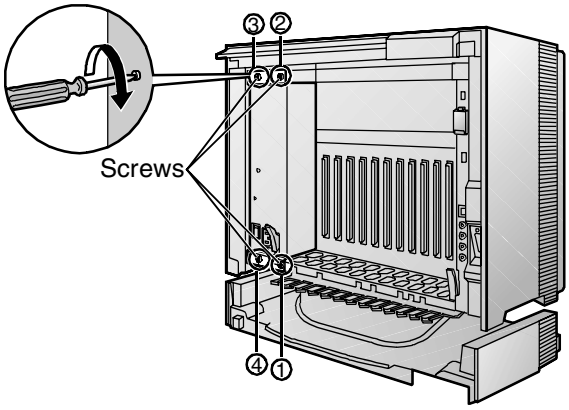
For safety reasons, do not touch parts in the PSU.




2. Push the release lever in the direction of the arrow, so that the PSU engages securely with the connector on the back board.

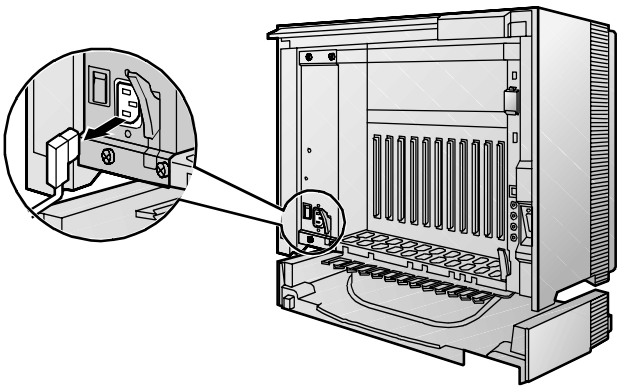


**3.** Turn the 4 screws clockwise, in the order indicated by the numbers 1 to 4, to fix the PSU.

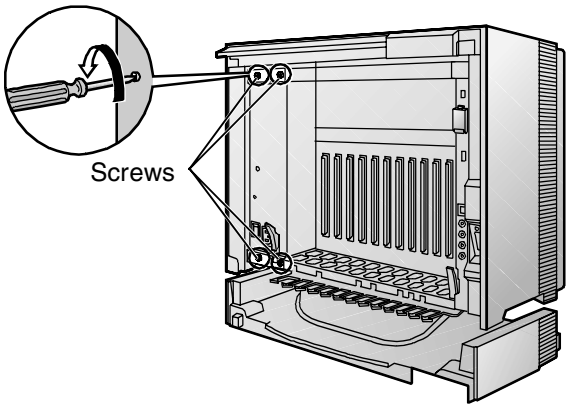



## Replacing the Power Supply Unit

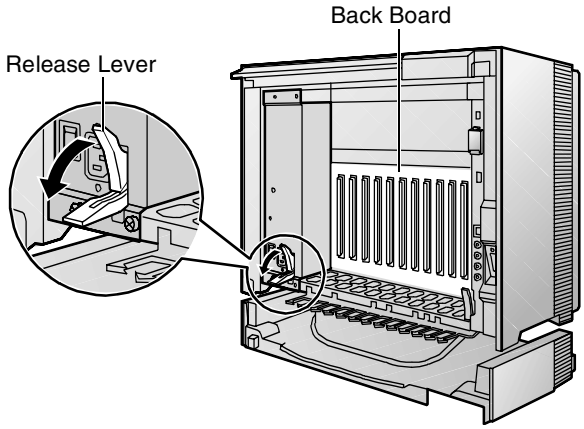
**1.** Unplug the AC power cord.



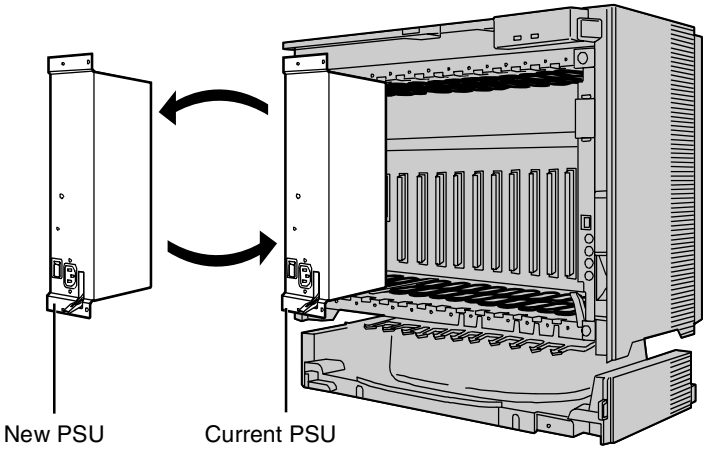
**2.** Turn the 4 screws counterclockwise to loosen them.



**3.** Pull the release lever in the direction of the arrow to disconnect the PSU from the back board.




**4.** Replace the PSU.



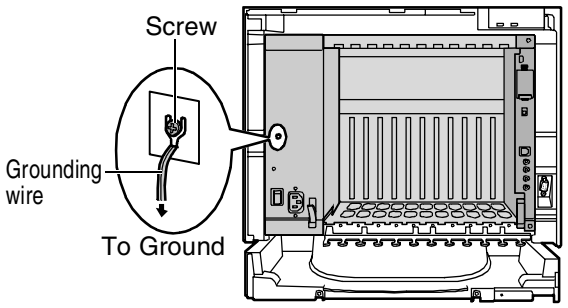

**5.** Follow the steps in "Installing the Power Supply Unit".

# 2.2.5 Frame Ground Connection

**IMPORTANT**

**Connect the frame of the Hybrid IP-PBX to earth.**

1. Loosen the screw.
2. Insert a grounding wire (user-supplied)*.
3. Tighten the screw.
4. Connect the grounding wire to earth.




* For grounding wire, green-and-yellow insulation is required, and the cross-sectional area of the conductor must be more than 0.75 $mm^2$ or 18 AWG.

- Be sure to comply with applicable local regulations (e.g., law, guidelines).
- Proper grounding (connection to earth) is very important to protect the Hybrid IP-PBX from the bad effects of external noise or to reduce the risk to the user of electrocution in the case of lightning strike.
- The ground wire of the AC cable has an effect against the external noise and lightning strikes, but it may not be enough to protect the Hybrid IP-PBX. A permanent connection between earth and the ground terminal of the Hybrid IP-PBX must be made.

In most of the continental United States, the ground provided by the "Third wire ground" at the commercial power outlet will be satisfactory. However, in a small percentage of cases this ground may be installed incorrectly. Therefore, the following test procedure should be performed.

## Test Procedure

1. Obtain a suitable voltmeter and set it for a possible reading of up to 250 V AC.
2. Connect the meter probes between the 2 main AC voltage points on the wall outlet. The reading obtained should be 108 V AC to 132 V AC.
3. Move one of the meter probes to the 3rd prong terminal (GND).
   Either the same reading or a reading of 0 volt should be obtained.
4. If a reading of 0 volt at one terminal and a reading of 108 V AC to 132 V AC at the other terminal is not obtained, the outlet is not properly grounded.
   This condition should be corrected by a qualified electrician (per article 250 of the National Electrical Code).
5. If a reading of 0 volt at one terminal and a reading of 108 V AC to 132 V AC at the other terminal is obtained, then set the meter to the "OHMS/RX1" scale, place one probe at the GND Terminal and the other probe at the terminal which gave a reading of 0 volt.
   A reading of less than 1 ohm should be obtained. If the reading is not obtained, the outlet is not adequately grounded. See qualified electrician.

## 2.2.6 Installing/Removing the Optional Service Cards

**CAUTION**

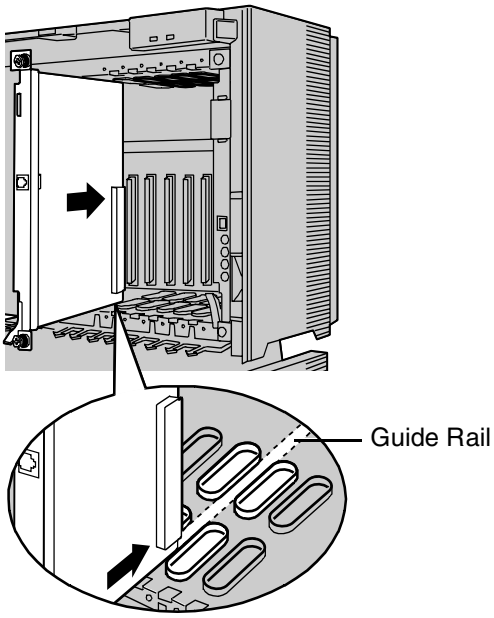
To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards. To discharge static electricity, touch ground or wear a grounding strap.

**Note**

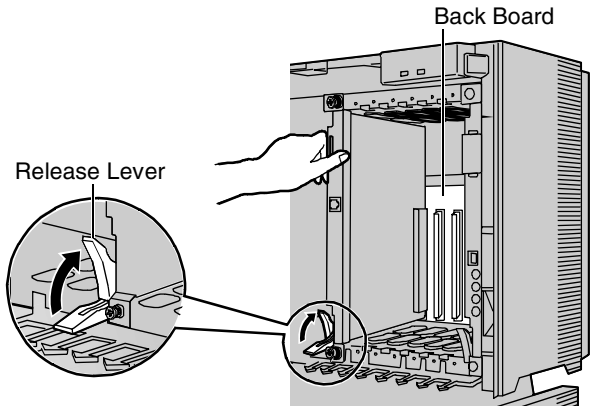
The optional service cards can be installed or removed while the DC power is supplied. However, when installing or removing the MPR card, the DC power supply must be turned off.

### Installing Optional Service Cards

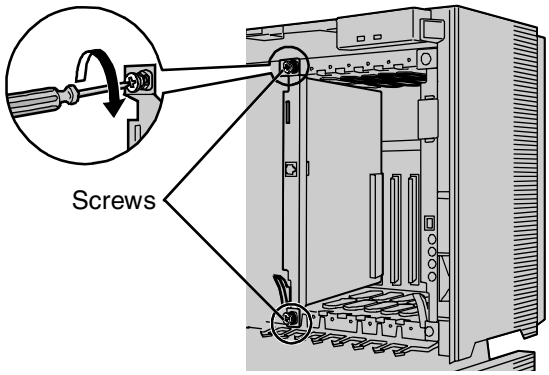
1. Insert the card along the guide rails.



**2.** Holding the card as shown below, push the release lever in the direction of the arrow so that the card engages securely with the connector on the back board.




**3.** Turn the 2 screws clockwise to fix the card in place.




**Note**

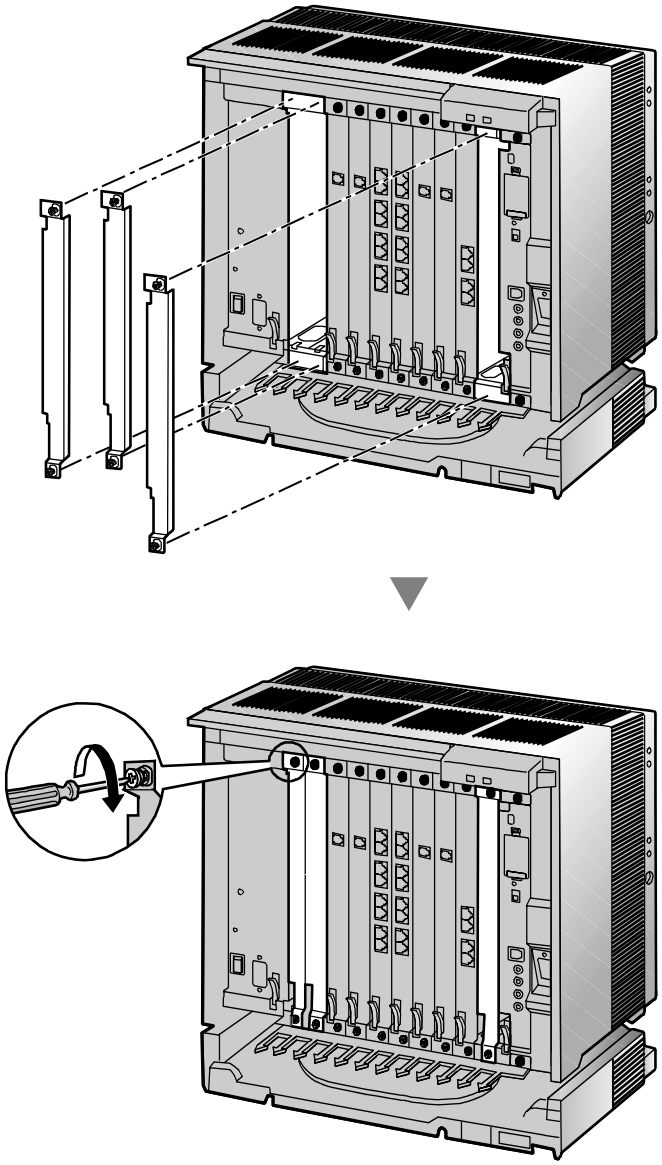
Make sure the screws are tightened to ground the card securely.

### Covering the Blank Slots

Be sure to cover each slot in which no optional service card is installed by using a Blank Slot Cover.

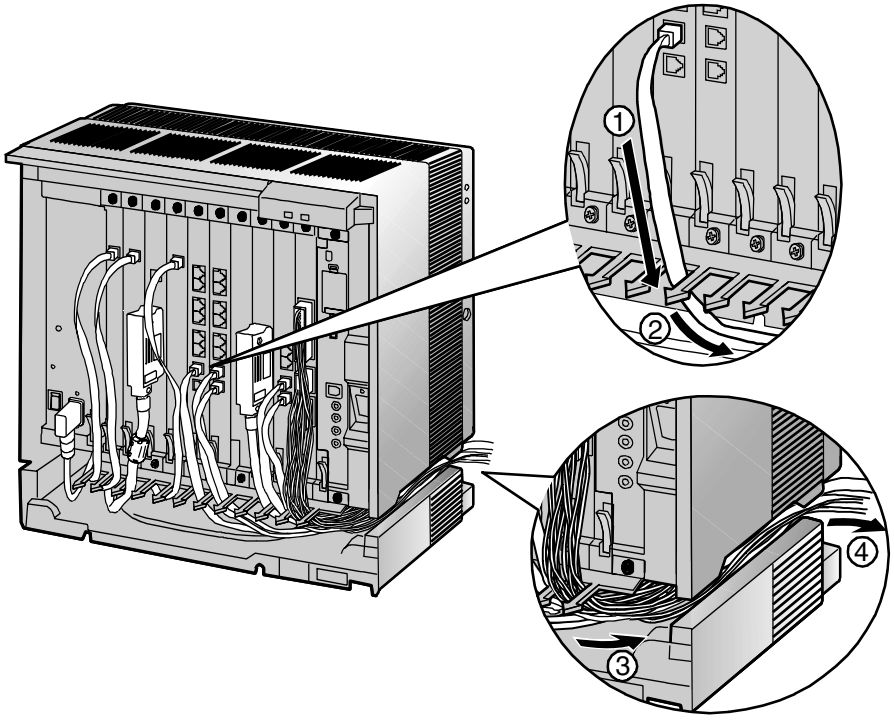
**CAUTION**

Failure to install the Blank Slot Cover may cause electromagnetic interferences.



## Handling of the Cables

When cables are connected to the Hybrid IP-PBX, run the cables to either right or left and then towards the backside of the cabinet as shown below.

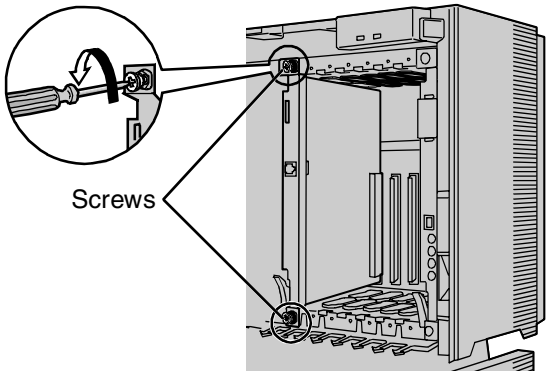



**Note**

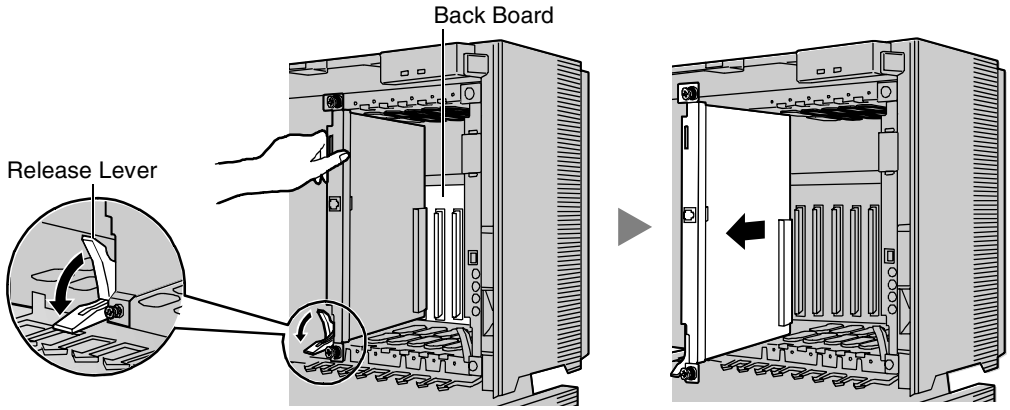
For safety reasons, do not stretch, bend, or pinch the AC power cord.

## Removing the Optional Service Cards

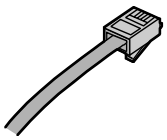
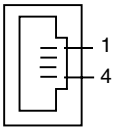
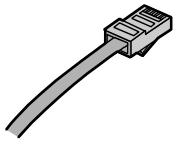
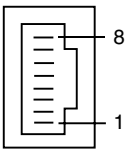
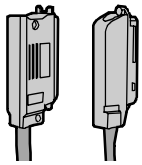
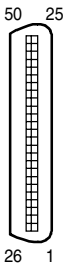
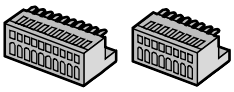
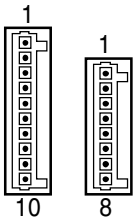
1. Turn the 2 screws counterclockwise to loosen them.

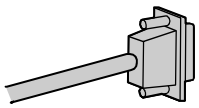
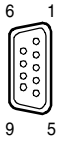
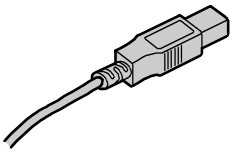
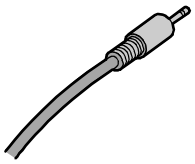



2. Pull the release lever in the direction of the arrow to disconnect the card from the back board. Pull the card from the cabinet to remove it.



## 2.2.7 Types of Connectors

| Connector Type | Pin Number | Used for |
|---|---|---|
| RJ11<br>  <br>(Twisted pair cable) |  | • DHLC8 (KX-TDA0170)<br>• SLC8 (KX-TDA0173)<br>• SLC16 (KX-TDA0174)<br>• MSLC16 (KX-TDA0175)<br>• LCOT8 (KX-TDA0180)<br>• LCOT16 (KX-TDA0181) |
| RJ45<br>  <br>(Twisted pair cable) |  | • CSIF4 (KX-TDA0143)<br>• CSIF8 (KX-TDA0144)<br>• T1 (KX-TDA0187)<br>• PRI23 (KX-TDA0290)<br>• CTI-LINK (KX-TDA0410)<br>• IP-EXT16 (KX-TDA0470)<br>• IP-GW4 (KX-TDA0480)<br>• IP-GW4E (KX-TDA0484)<br>• IP-GW16 (KX-TDA0490) |
| Amphenol<br>Type A Type B<br>  <br>(Shielded twisted pair cable) |  | • DHLC8 (KX-TDA0170)<br>• DLC8 (KX-TDA0171)<br>• DLC16 (KX-TDA0172)<br>• SLC8 (KX-TDA0173)<br>• SLC16 (KX-TDA0174)<br>• MSLC16 (KX-TDA0175)<br>• LCOT8 (KX-TDA0180)<br>• LCOT16 (KX-TDA0181) |
| 10-pin Terminal Block<br>8-pin Terminal Block<br>  |  | • DPH4 (KX-TDA0161)<br>• EIO4 (KX-TDA0164) |

| Connector Type | Pin Number | Used for |
|---|---|---|
| RS-232C  |   | • IP-GW4 (KX-TDA0480)<br>• Basic Shelf |
| USB  | | • MPR |
| Mini Plug  | | • MPR |

# 2.2.8 Attaching a Ferrite Core

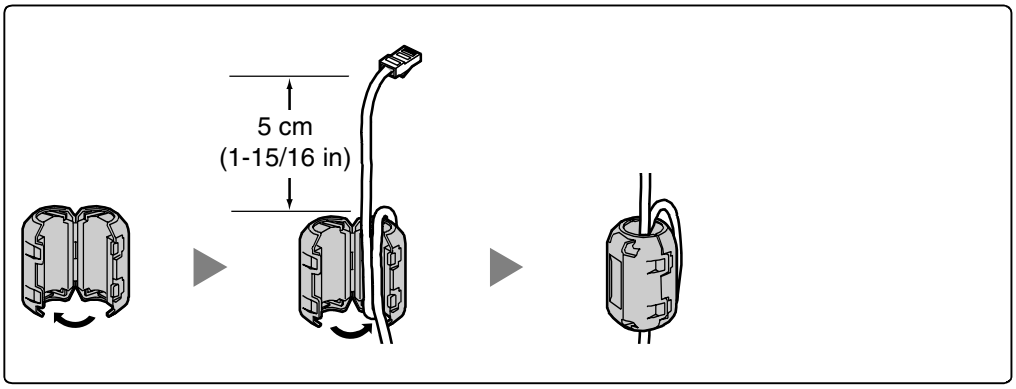
A ferrite core must be attached when:

- connecting IP-GW16 and IP-EXT16 cards using an RJ45 connector, or
- connecting extension cards using an Amphenol connector.

The ferrite core is included with the card.

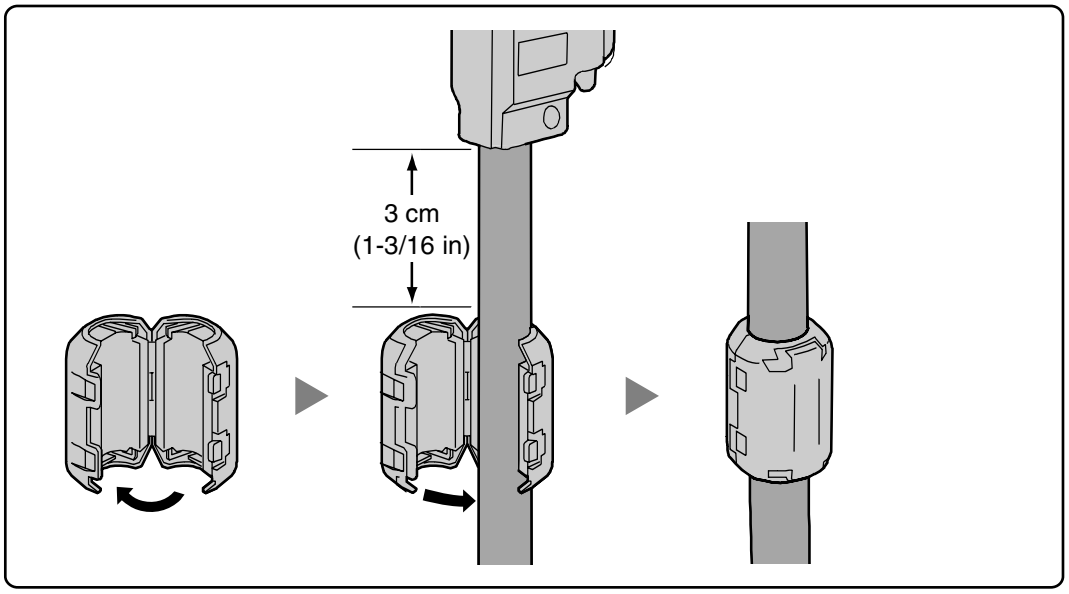
### When connecting an IP-GW16/IP-EXT16 card

Wrap the cable once around the ferrite core, then close the case of the ferrite core. Attach the ferrite core 5 cm (1-15/16 in) away from the connector.

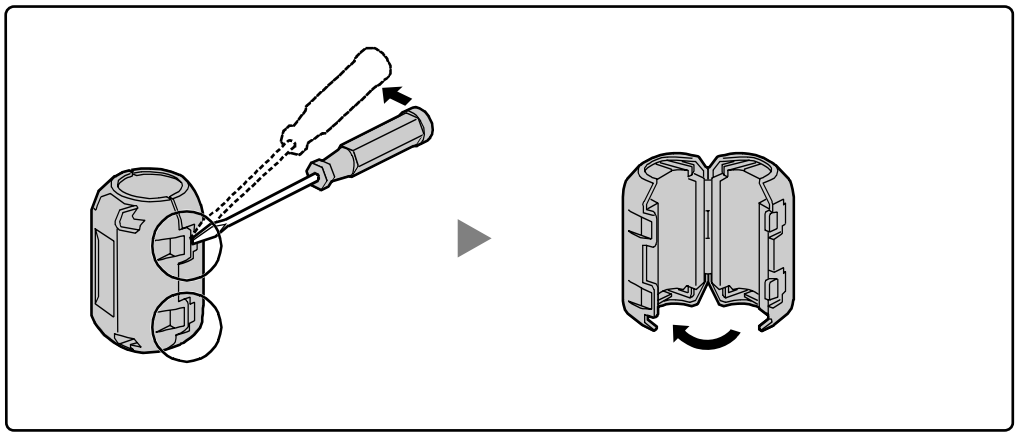



### When connecting an extension card

Pass the cable through the ferrite core, then close the case of the ferrite core. Attach the ferrite core 3 cm (1-3/16 in) away from the connector.

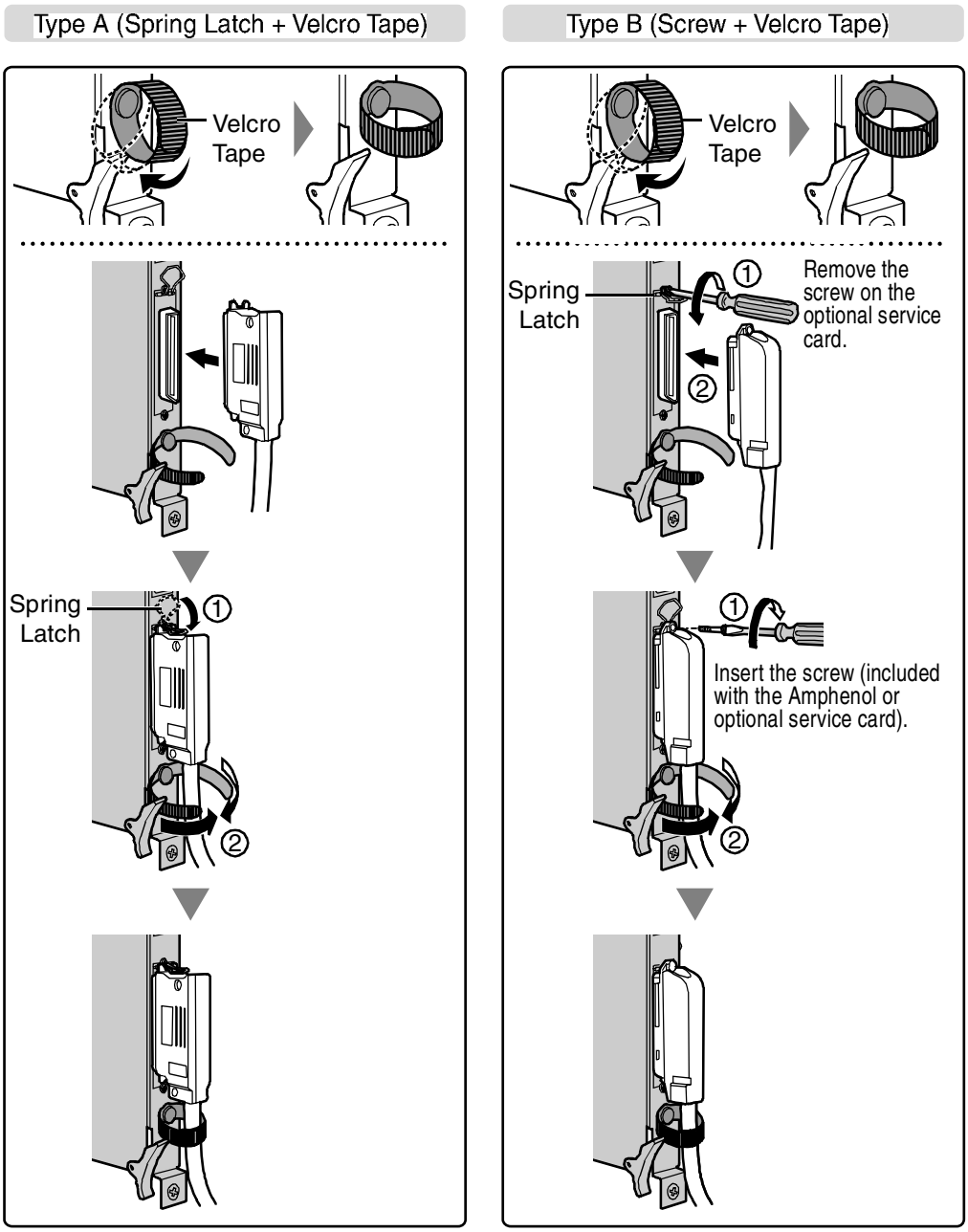


If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.



## 2.2.9 Fastening Amphenol Type Connector

An Amphenol 57JE type connector is used on some of the optional service cards.
To connect an Amphenol connector, use the spring latch or screw to fix the upper part and use Velcro® tape to fix the lower part of the connector.


Type A (Spring Latch + Velcro Tape)
Type B (Screw + Velcro Tape)
Velcro Tape
Velcro Tape
Spring Latch
Spring Latch
①
②
Remove the screw on the optional service card.
Insert the screw (included with the Amphenol or optional service card).

# Amphenol Connector Pin Assignment Chart

Below is an Amphenol connector pin assignment chart for all optional service cards that use the Amphenol connector. For more details, refer to the appropriate section in "2.4 Installation of the CO Line Cards" and "2.5 Installation of the Extension Cards".

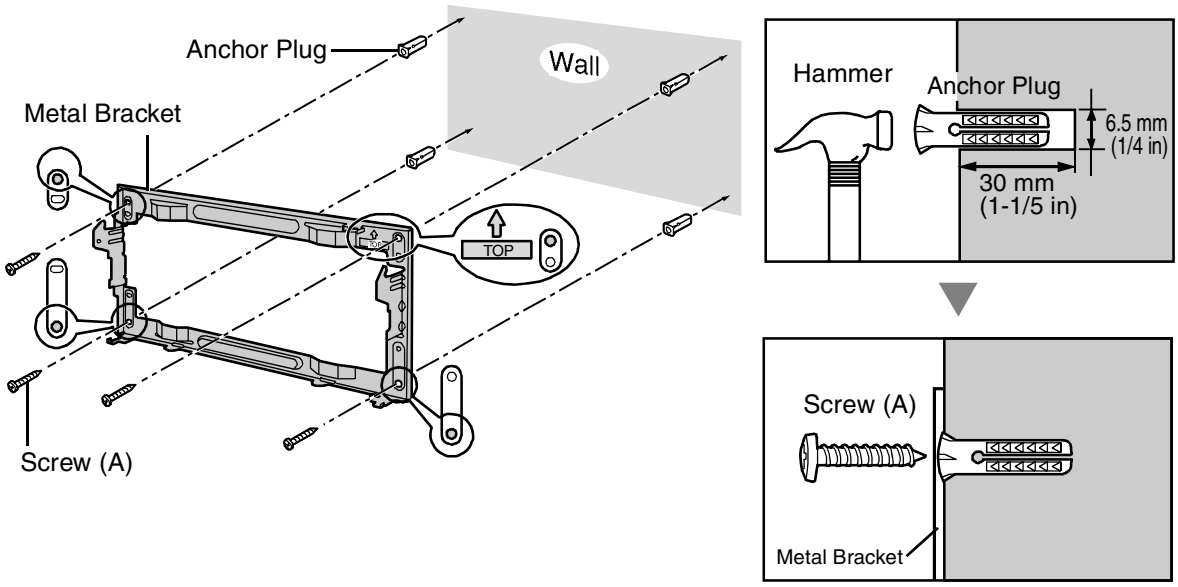
| Pin No. | LCOT8 | LCOT16 | DHLC8 | DLC8 | DLC16 | MSLC16 | SLC16 | SLC8 |
|---|---|---|---|---|---|---|---|---|
| 1 | RA | RA | RA | | D2A | RA | RA | RA |
| 26 | TA | TA | TA | | D1A | TA | TA | TA |
| 2 | RB | RB | D2A | D2A | D2B | RB | RB | |
| 27 | TB | TB | D1A | D1A | D1B | TB | TB | |
| 3 | RC | RC | | | D2C | RC | RC | |
| 28 | TC | TC | | | D1C | TC | TC | |
| 4 | RD | RD | RB | | D2D | RD | RD | RB |
| 29 | TD | TD | TB | | D1D | TD | TD | TB |
| 5 | RE | RE | D2B | D2B | D2E | RE | RE | |
| 30 | TE | TE | D1B | D1B | D1E | TE | TE | |
| 6 | RF | RF | | | D2F | RF | RF | |
| 31 | TF | TF | | | D1F | TF | TF | |
| 7 | RG | RG | RC | | D2G | RG | RG | RC |
| 32 | TG | TG | TC | | D1G | TG | TG | TC |
| 8 | RH | RH | D2C | D2C | D2H | RH | RH | |
| 33 | TH | TH | D1C | D1C | D1H | TH | TH | |
| 9 | | RI | | | D2I | RI | RI | |
| 34 | | TI | | | D1I | TI | TI | |
| 10 | | RJ | RD | | D2J | RJ | RJ | RD |
| 35 | | TJ | TD | | D1J | TJ | TJ | TD |
| 11 | | RK | D2D | D2D | D2K | RK | RK | |
| 36 | | TK | D1D | D1D | D1K | TK | TK | |
| 12 | | RL | | | D2L | RL | RL | |
| 37 | | TL | | | D1L | TL | TL | |
| 13 | | RM | RE | | D2M | RM | RM | RE |
| 38 | | TM | TE | | D1M | TM | TM | TE |
| 14 | | RN | D2E | D2E | D2N | RN | RN | |
| 39 | | TN | D1E | D1E | D1N | TN | TN | |
| 15 | | RO | | | D2O | RO | RO | |
| 40 | | TO | | | D1O | TO | TO | |
| 16 | | RP | RF | | D2P | RP | RP | RF |
| 41 | | TP | TF | | D1P | TP | TP | TF |
| 17 | | | D2F | D2F | | | | |
| 42 | | | D1F | D1F | | | | |
| 18 | | | | | | | | |
| 43 | | | | | | | | |
| 19 | | | RG | | | | | RG |
| 44 | | | TG | | | | | TG |
| 20 | | | D2G | D2G | | | | |
| 45 | | | D1G | D1G | | | | |
| 21 | | | | | | | | |
| 46 | | | | | | | | |
| 22 | | | RH | | | | | RH |
| 47 | | | TH | | | | | TH |
| 23 | | | D2H | D2H | | | | |
| 48 | | | D1H | D1H | | | | |
| 24 | | | | | | | | |
| 49 | | | | | | | | |
| 25 | | | | | | | | |
| 50 | | | | | | | | |

# 2.2.10 Wall Mounting (KX-TDA200)

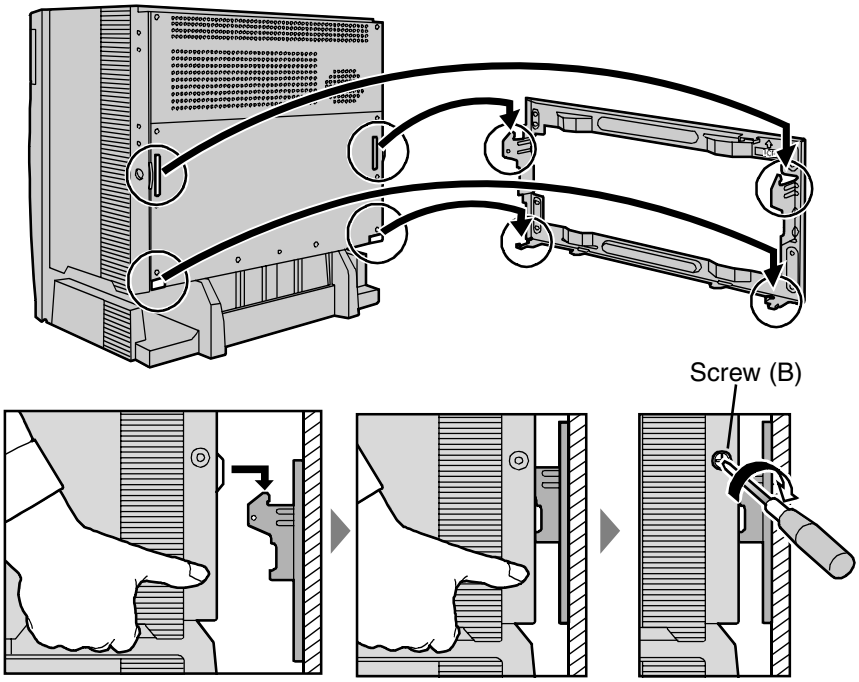
**CAUTION**

Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.

1. Install 4 anchor plugs in the wall, using the metal bracket as a template. Fix the metal bracket with 4 screws (A).



**2.** Hook the cabinet onto the metal bracket, making sure that the unit slides down and onto the hooked parts of the metal bracket. Use 2 screws (B) to fix both sides of the cabinet.




**Notes**

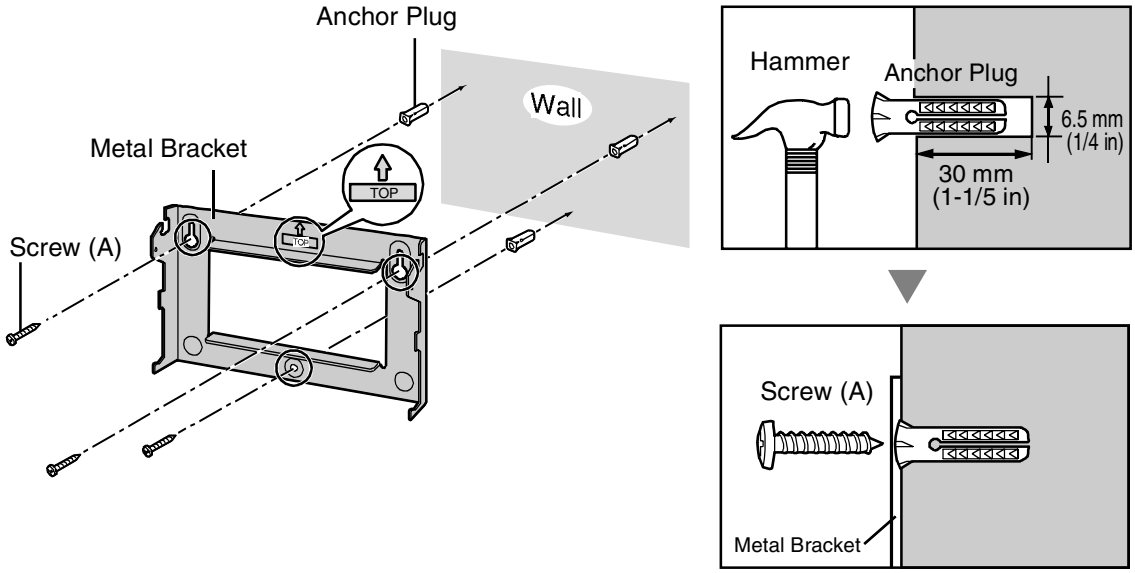
- Do not block the openings of the cabinet. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the cabinet.
- Make sure that the wall behind the cabinet is flat and free of obstacles, so that the openings on the back of the cabinet will not be blocked.
- Make sure that the wall behind the cabinet is not made of wood.
- Be careful not to drop the cabinet.

# 2.2.11 Wall Mounting (KX-TDA100)

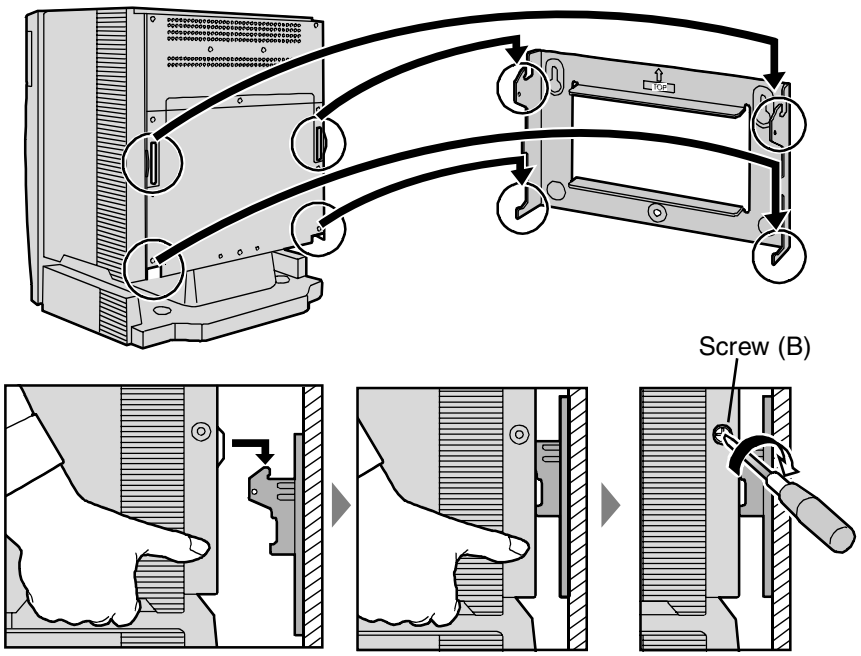
**CAUTION**

Drive mounting screws into the wall. Be careful to avoid touching any metal laths, wire laths or metal plates in the wall.

1. Install 3 anchor plugs in the wall, using the metal bracket as a template. Fix the metal bracket with 3 screws (A).



**2.** Hook the cabinet onto the metal bracket, making sure that the unit slides down and onto the hooked parts of the metal bracket. Use 2 screws (B) to fix both sides of the cabinet.

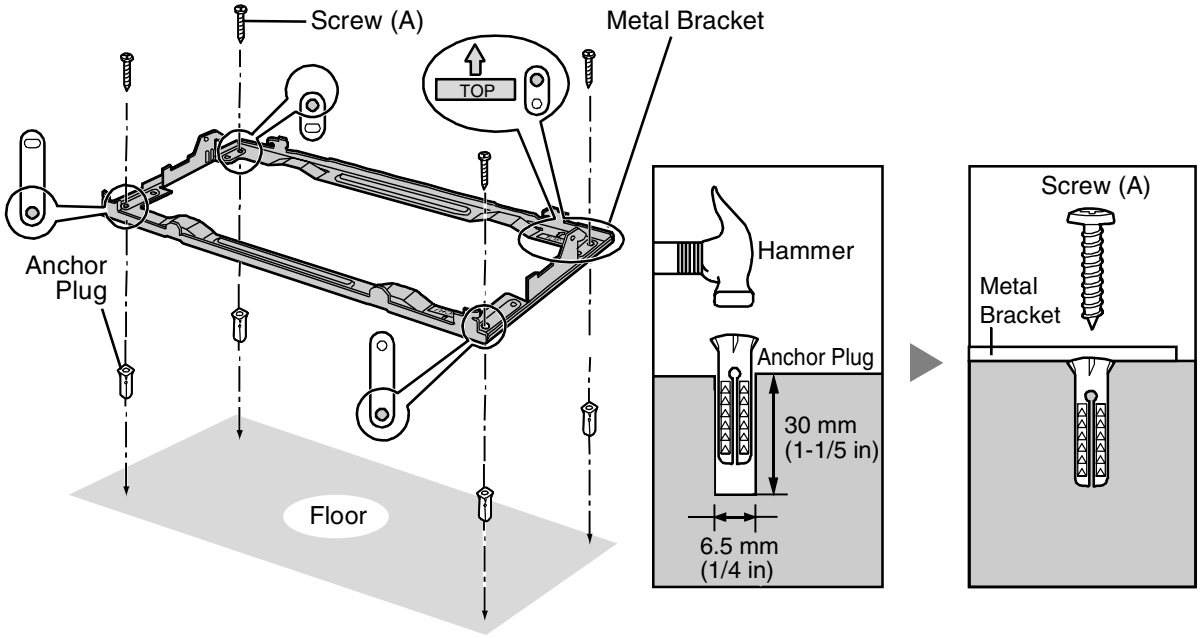



**Notes**

- Do not block the openings of the cabinet. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the cabinet.
- Make sure that the wall behind the cabinet is flat and free of obstacles, so that the openings on the back of the cabinet will not be blocked.
- Make sure that the wall behind the cabinet is not made of wood.
- Be careful not to drop the cabinet.

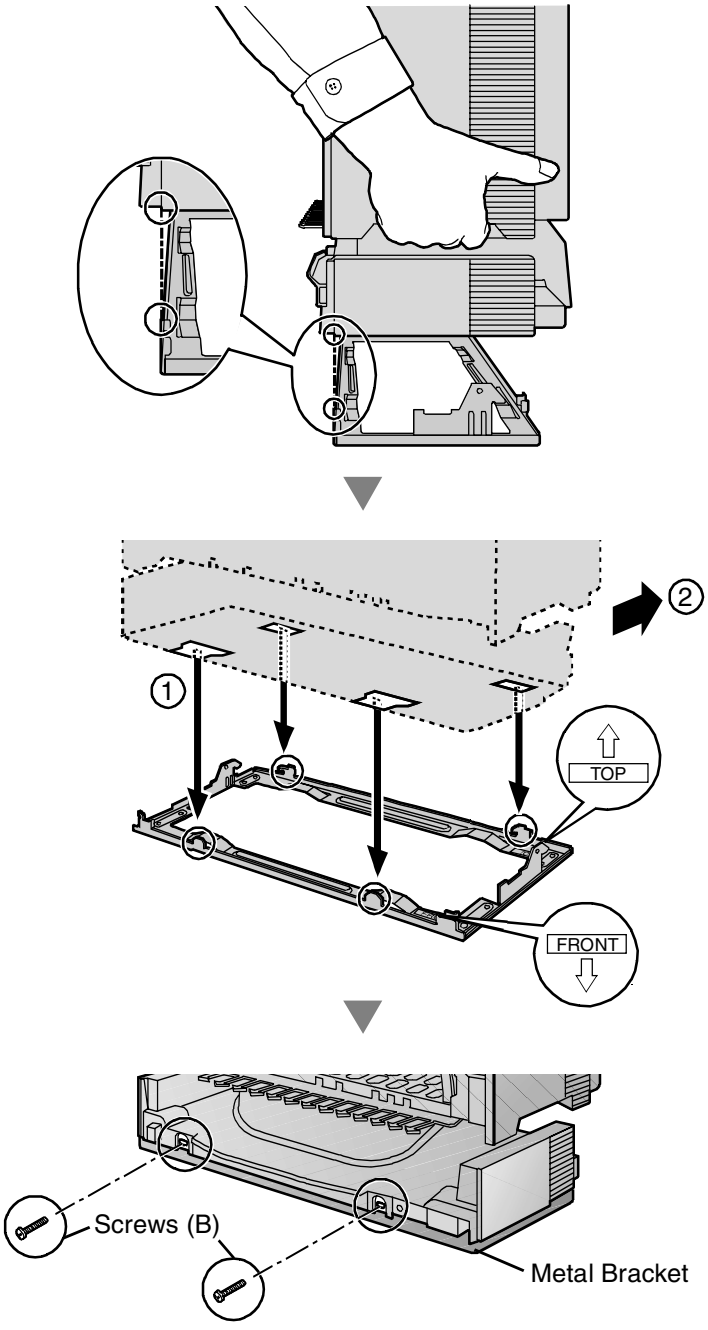
## 2.2.12 Floor Standing (KX-TDA200 Only)

**1.** Install 4 anchor plugs in the floor, using the metal bracket as a template. Fix the metal bracket with 4 screws (A).




**2.** Remove the front cover of the cabinet (refer to "2.2.3 Opening/Closing the Front Cover").

**3.** Lift the cabinet, attach it to the metal bracket, slide it backwards until it locks, and retain it with 2 screws (B).




**Notes**

- Do not block the openings of the cabinet. Allow space of at least 20 cm (8 in) above and 10 cm (4 in) at the sides of the cabinet.
- Make sure that the surface behind the cabinet is flat and free of obstacles, so that the openings on the back of the cabinet will not be blocked.

- Make sure that the surface behind the cabinet is not made of wood.
- Be careful not to drop the cabinet.

4. Fix the front cover on the cabinet (refer to "2.2.3 Opening/Closing the Front Cover").

# 2.2.13 Surge Protector Installation

## Overview

A massive electrical surge can be caused if lightning strikes a telephone cable 10 m (33 ft) above ground, or if a telephone line comes into contact with a power line. A surge protector is a device that is connected to a CO line to prevent potentially dangerous electrical surges from entering the building via the CO line and damaging the Hybrid IP-PBX and connected equipment.

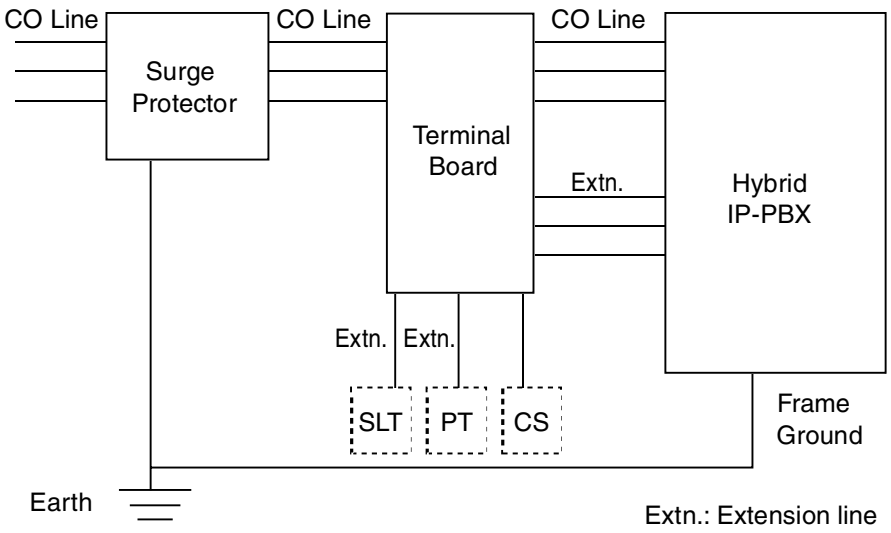
To protect the system from electrical surges, we strongly recommend connecting the system to a surge protector that meets the following specifications:

- Surge arrestor type: 3-electrode arrestor
- DC spark-over voltage: 230 V
- Maximum peak current: at least 10 kA

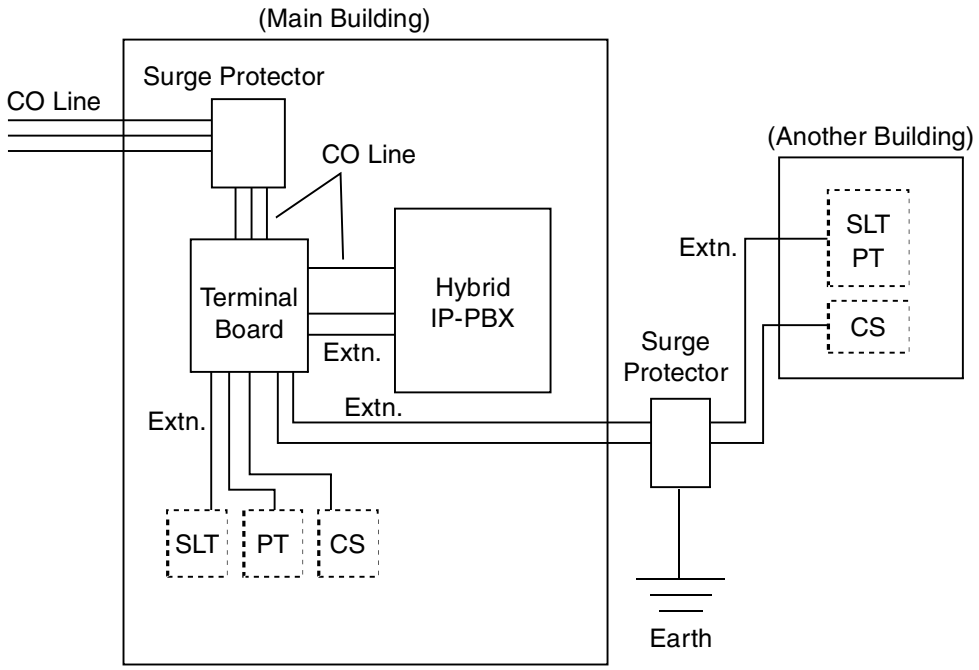
Additionally, proper earthing is very important for the protection of the system (refer to "2.2.5 Frame Ground Connection").

Many countries/areas have regulations requiring surge protection. Be sure to comply with all applicable laws, regulations, and guidelines.

## Installation



## Outside Installation




Extn.: Extension Line

If you install an extension outside of the building, the following precautions are recommended:

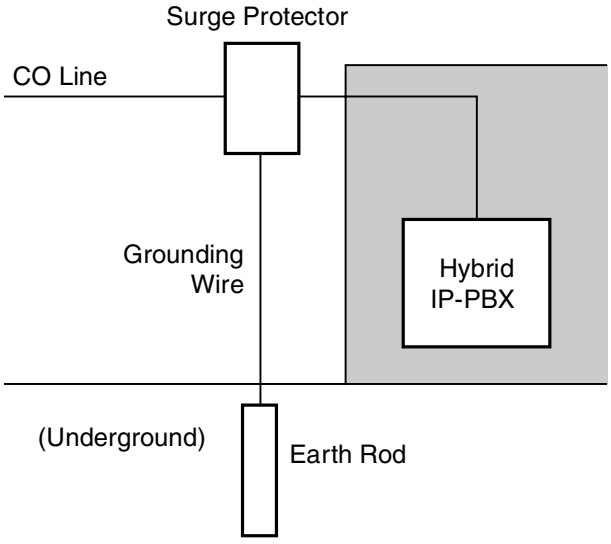
**a.** Install the extension wire underground.

**b.** Use a conduit to protect the wire.

**Note**

The surge protector for an extension and CS is different from that for a CO line.

## Installation of an Earth Rod



1. Connect the earth rod to the surge protector using an earthing wire with a cross-sectional area of at least 1.3 $mm^2$.
2. Bury the earth rod near the protector. The earthing wire should be as short as possible.
3. The earthing wire should run straight to the earth rod. Do not run the wire around other objects.
4. Bury the earth rod at least 50 cm (20 in) underground.

**Notes**

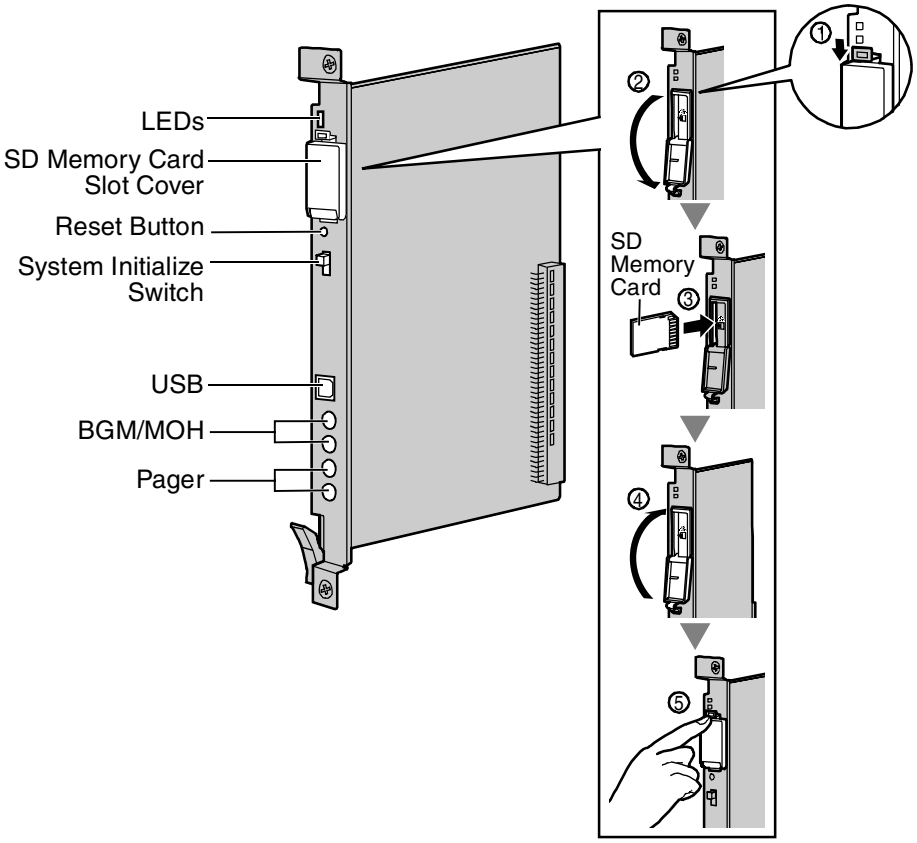
- The above figures are recommendations only.
- The length of earth rod and the required depth depend on the composition of the soil.

# 2.3 Installation of the Main Processing Card

## 2.3.1 MPR Card

### Function

Contains the main processor for all processes, basic shelf main protocol, time switch (TSW) control, detection of system clock alarm, basic shelf power down alarm, and watchdog timer overflow. An MEC card and an RMT card can be mounted on the MPR card (refer to "2.3.2 MEC Card" and "2.3.3 RMT Card").




**Notes**

- For details about connecting peripherals, refer to "2.10.1 Connection of Peripherals".
- For details about System Initialize Switch, refer to "2.12.1 Starting the Hybrid IP-PBX".
- For details about Reset Button, refer to "4.1.4 Using the Reset Button".

**CAUTION**

- Use only the SD Memory Card included with the Hybrid IP-PBX, or a Panasonic optional upgrade SD Memory Card.
- The SD Memory Card contains software for all processes of the Hybrid IP-PBX and all customer data. The SD Memory Card must be inserted before startup.
- Do not remove the SD Memory Card while power is supplied to the Hybrid IP-PBX. Doing so may cause the Hybrid IP-PBX to fail to start when you try to restart the system.

- A LITHIUM BATTERY IS USED IN THE MPR CARD. THERE IS A RISK OF EXPLOSION IF BATTERY IS REPLACED WITH THE INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

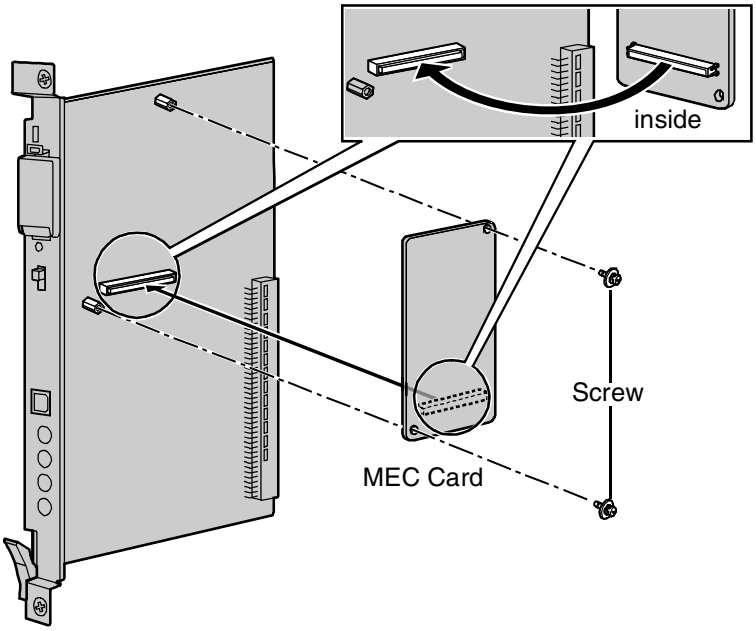
## LED Indications

| Indication | Color | Description |
|---|---|---|
| BATT ALARM | Red | Battery alarm indication<br>• OFF: Normal<br>ON: Alarm |
| SD ACCESS | Green | SD memory card status<br>• ON: Accessing |

# 2.3.2 MEC Card

## Function

Memory expansion card to increase system data storage space, enable Broadcasting feature, and double the number of DPTs, using Digital XDP connection. To be mounted on the MPR card.




### Accessory and User-supplied Items

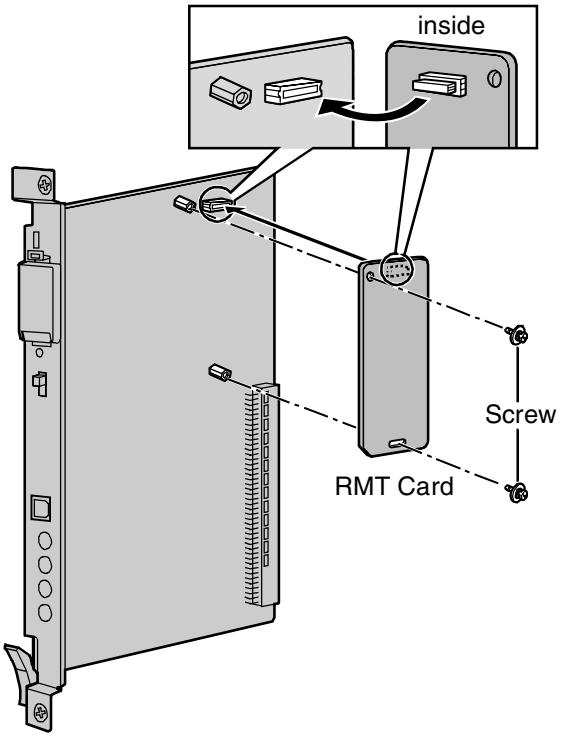
**Accessory (included):** Screws × 2

**User-supplied (not included):** none

# 2.3.3 RMT Card

## Function

Analog modem card for remote communication with the Hybrid IP-PBX. ITU-T V.90 support. To be mounted on the MPR card.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2

**User-supplied (not included):** none

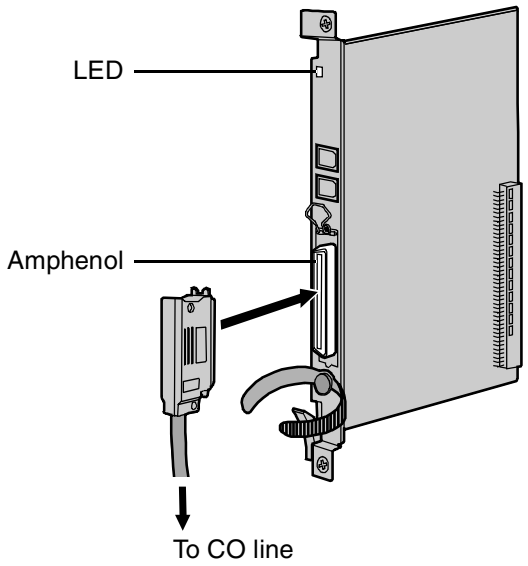
# 2.4 Installation of the CO Line Cards

## 2.4.1 LCOT8 and LCOT16 Cards

### Function

**LCOT8:** 8-port analog CO line card with 2 power failure transfer (PFT) ports. One CID8 card can be mounted on the LCOT8 card (refer to "2.4.2 CID8 Card").

**LCOT16:** 16-port analog CO line card with 4 power failure transfer (PFT) ports. A maximum of 2 CID8 cards can be mounted on the LCOT16 card (refer to "2.4.2 CID8 Card").




#### Accessory and User-supplied Items

**Accessory (included):** Screws × 2

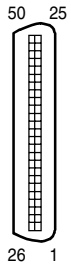
**User-supplied (not included):** Amphenol connector

**Notes**

- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".
- For details about power failure transfer, refer to "2.11.1 Power Failure Connections".
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

# Pin Assignments

### Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | RA | Ring port 1 | 26 | TA | Tip port 1 |
| 2 | RB | Ring port 2 | 27 | TB | Tip port 2 |
| 3 | RC | Ring port 3 | 28 | TC | Tip port 3 |
| 4 | RD | Ring port 4 | 29 | TD | Tip port 4 |
| 5 | RE | Ring port 5 | 30 | TE | Tip port 5 |
| 6 | RF | Ring port 6 | 31 | TF | Tip port 6 |
| 7 | RG | Ring port 7 | 32 | TG | Tip port 7 |
| 8 | RH | Ring port 8 | 33 | TH | Tip port 8 |
| 9 | RI | Ring port 9 | 34 | TI | Tip port 9 |
| 10 | RJ | Ring port 10 | 35 | TJ | Tip port 10 |
| 11 | RK | Ring port 11 | 36 | TK | Tip port 11 |
| 12 | RL | Ring port 12 | 37 | TL | Tip port 12 |
| 13 | RM | Ring port 13 | 38 | TM | Tip port 13 |
| 14 | RN | Ring port 14 | 39 | TN | Tip port 14 |
| 15 | RO | Ring port 15 | 40 | TO | Tip port 15 |
| 16 | RP | Ring port 16 | 41 | TP | Tip port 16 |
| 17-25 | Reserved | – | 42-50 | Reserved | – |

**Note**

Pin assignments for the pins 9 to 16 and 34 to 41 are for the LCOT16 card only.

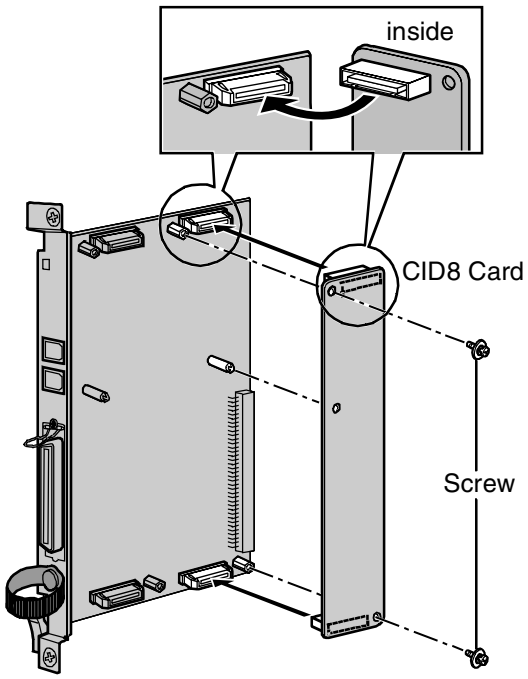
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.4.2 CID8 Card

## Function

8-port Caller ID signal type FSK/FSK (with Call Waiting Caller ID [Visual Caller ID])/DTMF. To be mounted on the LCOT8/LCOT16 cards.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2

**User-supplied (not included):** none

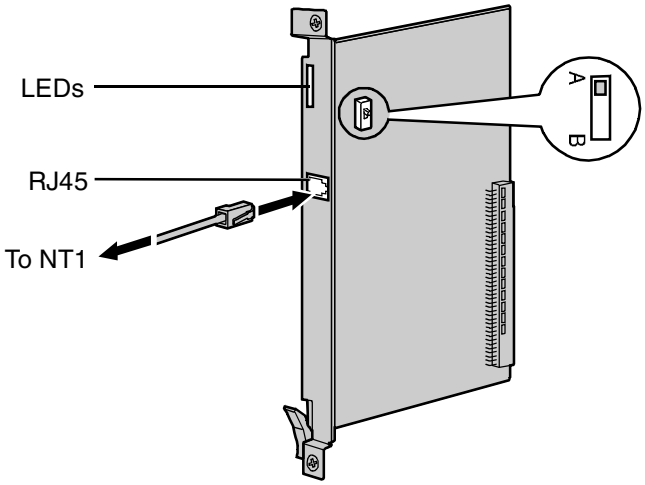
**Note**

Only 1 CID8 card can be mounted on the LCOT8 card.

# 2.4.3 T1 Card

## Function

1-port T1 CO line card. EIA/TIA standard compliant.




### Accessory and User-supplied Items

**Accessory (included):** none

**User-supplied (not included):** RJ45 connector

**Notes**

- Connect this optional service card to the CO line through NT1; do not connect to the CO line directly.
- T1 Card must be installed behind an FCC registered and UL or CSA-NRTL listed CSU.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

**CAUTION**

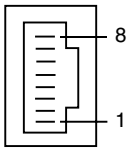
T1 ports are SELV ports and should only be connected to SELV services.

## Switch Settings

| Switch | Type | Usage and Status Definition |
|---|---|---|
| A/B | Slide | Keep the switch at default A position. Do not change the position of this switch. |

# Pin Assignments

### RJ45 Connector




| No. | Signal Name | Level [V] | Function |
|---|---|---|---|
| 1 | RX+ | (+) | Receive data (+) |
| 2 | RX- | (-) | Receive data (-) |
| 3 | Reserved | – | – |
| 4 | TX- | (-) | Transmit data (-) |
| 5 | TX+ | (+) | Transmit data (+) |
| 6-8 | Reserved | – | – |

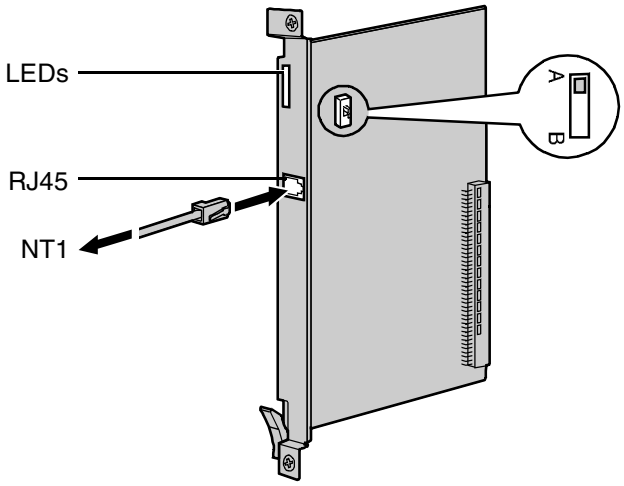
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| SYNC-ERR | Red | Non-synchronization status indication<br>• OFF: Normal<br>• ON: Out of synchronization |
| RAI | Red | RAI signal status indication<br>• OFF: Normal<br>• ON: Alarm (Clock Slave)<br>• Flashing (60 times per minute): Alarm (Clock Master) |
| AIS | Red | AIS status indication<br>• OFF: Normal<br>• ON: Alarm |
| SYNC | Green | Synchronization status indication<br>• OFF: Not synchronized<br>• ON: Synchronized<br>• Flashing (60 times per minute): Synchronized (Clock Master) |

# 2.4.4 PRI23 Card

## Function

1-port ISDN Primary Rate Interface card (23B channels). NI (North American standard ISDN protocol) compliant.




### Accessory and User-supplied Items

**Accessory (included):** none

**User-supplied (not included):** RJ45 connector

**Notes**

- Connect this optional service card to the CO line through an NT1; do not connect to the U interface of the CO line directly.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

**CAUTION**

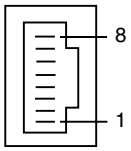
PRI ports are SELV ports and should only be connected to SELV services.

## Switch Settings

| Switch | Type | Usage and Status Definition |
|---|---|---|
| A/B | Slide | Keep the switch at default A position. Do not change the position of this switch. |

# Pin Assignments

### RJ45 Connector




| No. | Signal Name | Level [V] | Function |
|---|---|---|---|
| 1 | RX+ | (+) | Receive data (+) |
| 2 | RX- | (-) | Receive data (-) |
| 3 | Reserved | – | – |
| 4 | TX- | (-) | Transmit data (-) |
| 5 | TX+ | (+) | Transmit data (+) |
| 6-8 | Reserved | – | – |

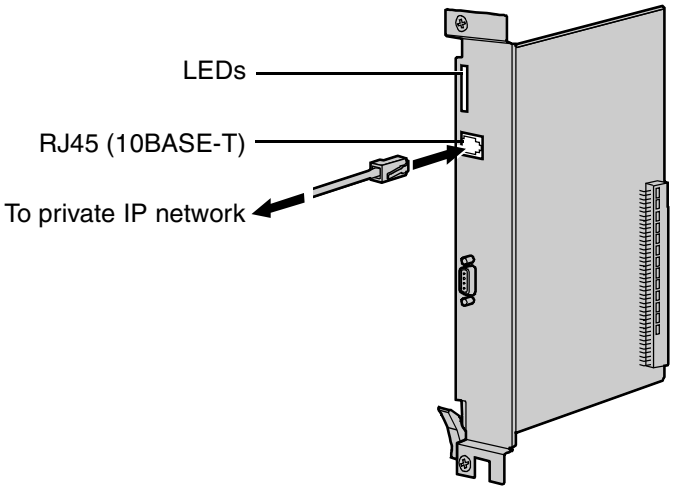
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| SYNC-ERR | Red | Non-synchronization status indication<br>• OFF: Normal<br>• ON: Out of synchronization |
| RAI | Red | RAI signal status indication<br>• OFF: Normal<br>• ON: Alarm (Clock Slave)<br>• Flashing (60 times per minute): Alarm (Clock Master) |
| AIS | Red | AIS status indication<br>• OFF: Normal<br>• ON: Alarm |
| SYNC | Green | Synchronization status indication<br>• OFF: Not synchronized<br>• ON: Synchronized<br>• Flashing (60 times per minute): Synchronized (Clock Master) |
| D-LINK | Green | Data link status indication<br>• OFF: Not established<br>• ON: Established |

# 2.4.5 IP-GW4 Card

## Function

4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, and G.723.1 CODEC methods. G3 fax support.




### Accessory and User-supplied Items

**Accessory (included):** CD-ROM (including PC programming software and documentation) × 1

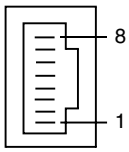
**User-supplied (not included):** RJ45 connector

**Notes**

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- The IP-GW4 card occupies the space of 2 free slots when it is installed in the Hybrid IP-PBX.
- For programming instructions and other information of the IP-GW4 card, refer to the documentation for the IP-GW4 card. To program the IP-GW4 card, use the PC programming software designed for the IP-GW4 card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

## Pin Assignments

### RJ45 Connector (10BASE-T)




| No. | Signal Name | Input (I)/Output (O) | Function |
|---|---|---|---|
| 1 | TPO+ | O | Transmit data+ |
| 2 | TPO- | O | Transmit data- |
| 3 | TPI+ | I | Receive data+ |
| 4-5 | Reserved | – | – |
| 6 | TPI- | I | Receive data- |
| 7-8 | Reserved | – | – |

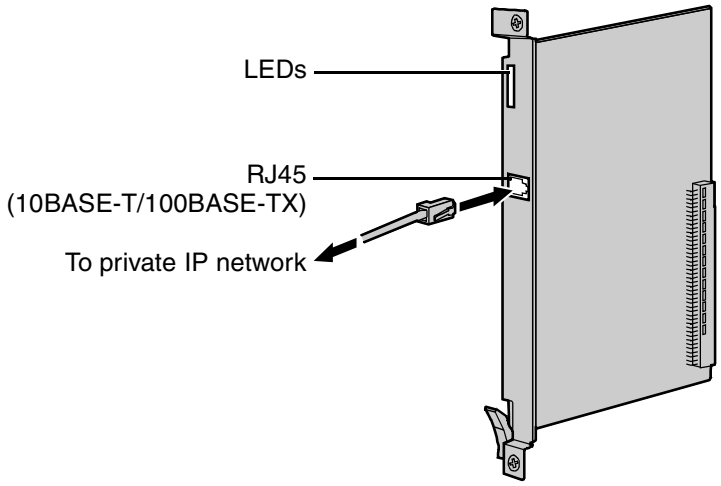
## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| ONLINE | Green | On-line status indication<br>• ON: On-line mode<br>• Flashing: Emergency maintenance mode |
| ALARM | Red | Alarm indication<br>• OFF: Normal<br>• ON: Alarm |
| IAM BUSY | Green | Busy status indication<br>• OFF: Not used<br>• ON: At least one line is used |
| LINK | Green | Link status indication<br>• OFF: Connection error<br>• ON: Normal connection |
| DATA | Green | Data transmission indication<br>• OFF: No data transmitted<br>• ON: Data transmitting |
| COL | Green | Data collision indication<br>• OFF: No data collision<br>• ON: Data collision |
| SIOSEL | Green | Serial maintenance port status indication<br>• OFF: CPU power port used (maintenance port not available)<br>• ON: Maintenance port available |

# 2.4.6 IP-GW4E Card

## Function

4-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, G.723.1, and G.711 CODEC methods.




### Accessory and User-supplied Items

**Accessory (included):** CD-ROM (including documentation for web programming) × 1

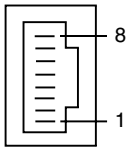
**User-supplied (not included):** RJ45 connector

**Notes**

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- The IP-GW4E card occupies the space of only 1 free slot when it is installed in the Hybrid IP-PBX.
- For programming instructions and other information about the IP-GW4E card, refer to the documentation for the IP-GW4E card. To program the IP-GW4E card, use the web programming designed for the IP-GW4E card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

## Pin Assignments

### RJ45 Connector (10BASE-T/100BASE-TX)




| No. | Signal Name | Input (I)/Output (O) | Function |
|---|---|---|---|
| 1 | TPO+ | O | Transmit data+ |
| 2 | TPO- | O | Transmit data- |
| 3 | TPI+ | I | Receive data+ |
| 4-5 | Reserved | – | – |
| 6 | TPI- | I | Receive data- |
| 7-8 | Reserved | – | – |

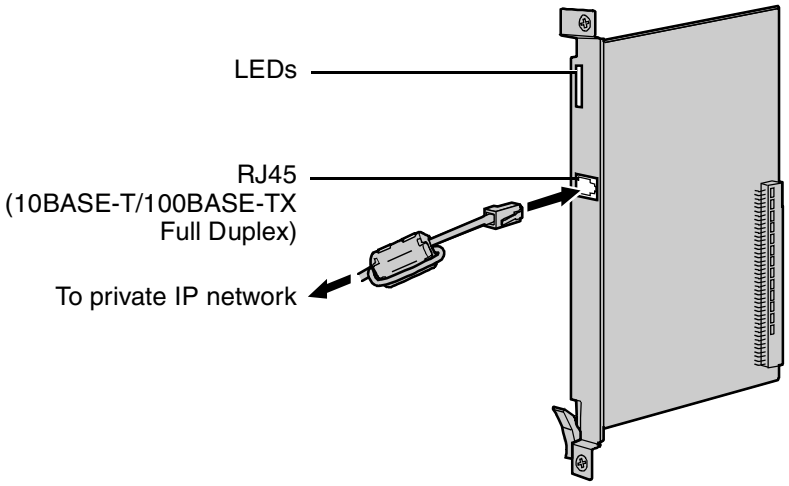
## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| ONLINE | Green | On-line status indication<br>• ON: On-line mode<br>• OFF: Off-line mode<br>• Flashing: Maintenance mode<br>**Note**<br>If the LINK indicator is OFF, the ONLINE indicator will also be OFF. |
| ALARM | Red | Alarm indication<br>• OFF: Normal<br>• ON: Alarm |
| VoIP BUSY | Green | VoIP (H.323) process indication<br>• OFF: VoIP process inactive<br>• ON: VoIP process active |
| LINK | Green | Link status indication<br>• OFF: Connection error<br>• ON: Normal connection |
| DATA | Green | Data transmission indication<br>• OFF: No data transmitted<br>• ON: Data transmitting |

# 2.4.7 IP-GW16 Card

## Function

16-channel VoIP gateway card. Compliant with VoIP H.323 V.2 protocol, and ITU-T G.729a, G.723.1, and G.711 CODEC methods.




### Accessory and User-supplied Items

**Accessory (included):** Ferrite core × 1, CD-ROM (including documentation for web programming) × 1

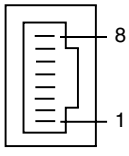
**User-supplied (not included):** RJ45 connector

**Notes**

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "2.2.8 Attaching a Ferrite Core".
- For programming instructions and other information about the IP-GW16 card, refer to the documentation for the IP-GW16 card. To program the IP-GW16 card, use the web programming designed for the IP-GW16 card.
- To confirm the CO line connection, refer to "Confirming the CO Line Connection" in "2.12.1 Starting the Hybrid IP-PBX".

## Pin Assignments

### RJ45 Connector (10BASE-T/100BASE-TX)




| No. | Signal Name | Input (I)/Output (O) | Function |
|---|---|---|---|
| 1 | TPO+ | O | Transmit data+ |
| 2 | TPO- | O | Transmit data- |
| 3 | TPI+ | I | Receive data+ |
| 4-5 | Reserved | – | – |
| 6 | TPI- | I | Receive data- |
| 7-8 | Reserved | – | – |

## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| ONLINE | Green | On-line status indication<br>• ON: On-line mode<br>• OFF: Off-line mode<br>• Flashing: Maintenance mode<br>**Note**<br>If the LINK indicator is OFF, the ONLINE indicator will also be OFF. |
| ALARM | Red | Alarm indication<br>• OFF: Normal<br>• ON: Alarm |
| VoIP BUSY | Green | VoIP (H.323) process indication<br>• OFF: VoIP process inactive<br>• ON: VoIP process active |
| LINK | Green | Link status indication<br>• OFF: Connection error<br>• ON: Normal connection |
| DATA | Green | Data transmission indication<br>• OFF: No data transmitted<br>• ON: Data transmitting |

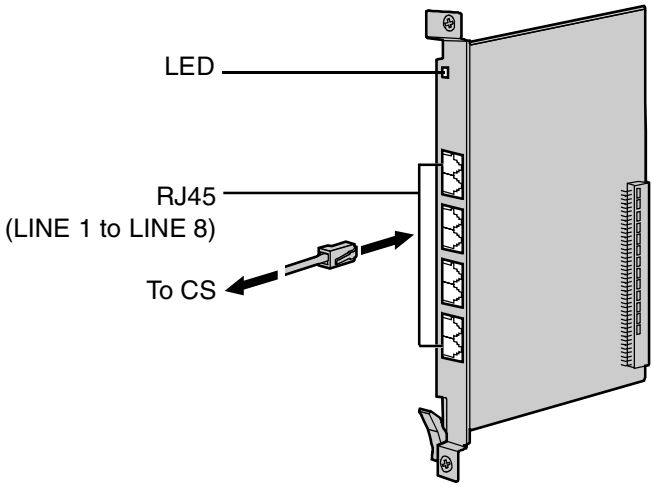
# 2.5 Installation of the Extension Cards

## 2.5.1 CSIF4 and CSIF8 Card

### Function

**CSIF4:** 4-port CS interface card for 4 CSs.

**CSIF8:** 8-port CS interface card for 8 CSs.




#### Accessory and User-supplied Items

**Accessory (included):** none

**User-supplied (not included):** RJ45 connector

**Notes**

- LINE 5 to LINE 8 are for CSIF8 card only.
- When using the CSIF4 card, please note that the Hybrid IP-PBX software will recognize the CSIF4 card as the CSIF8 card. As a result, 8 cell stations may appear to be available; however, only 4 cell stations are supported by the CSIF4 card.
- For details about connecting the CS, refer to "2.8.7 Connecting a Cell Station to the Hybrid IP-PBX".

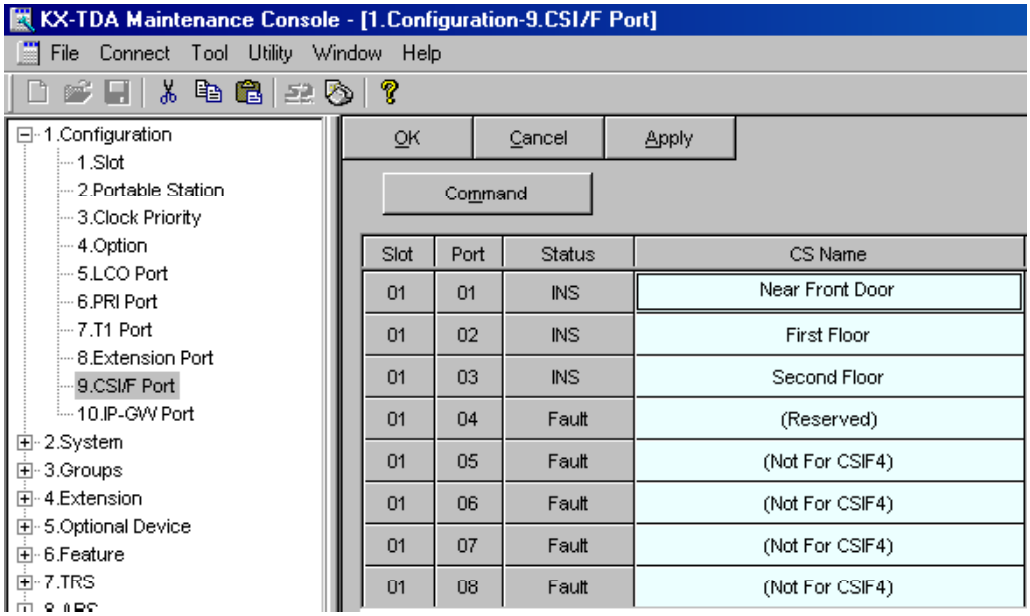
### Editing the CS Name using the KX-TDA Maintenance Console

While programming the Hybrid IP-PBX, we strongly recommend that you input a unique recognizable CS name (maximum 20 characters) for each CS port in use, and "(Reserved)" or "(Not for CSIF4)" for unused ports or unavailable ports respectively for the following reasons:

**a.** you will be able to easily distinguish installed CSs.

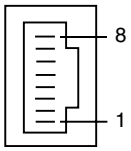
**b.** you will be able to know which CSIF card has been installed; CSIF4 or CSIF8.

**Example: When the CSIF4 card has been installed**[*1]




# Pin Assignments

### RJ45 Connector




| No. | Signal Name | Function |
|---|---|---|
| 1-2 | Reserved | – |
| 3 | D1 | Data port (High) |
| 4 | POWH | Power (High) |
| 5 | POWL | Power (Low) |
| 6 | D2 | Data port (Low) |
| 7-8 | Reserved | – |

[*1] The contents and design of the software are subject to change without notice.

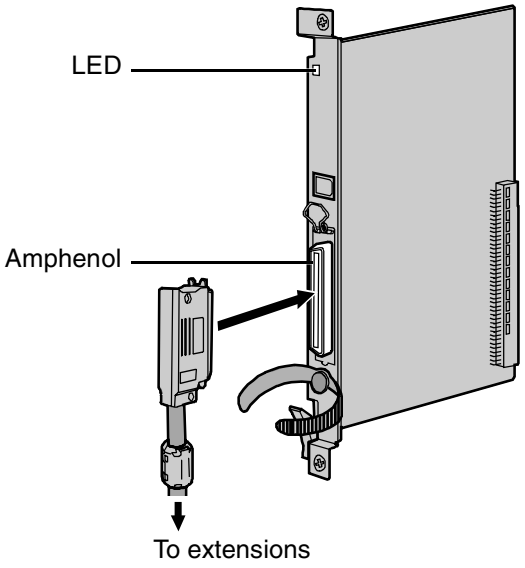
## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.2 DHLC8 Card

## Function

8-port digital hybrid extension card for DPTs, APTs, SLTs, DSS consoles, and PT-interface CSs, with 2 power failure transfer (PFT) ports.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2, Ferrite core × 1

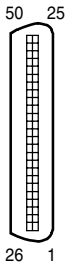
**User-supplied (not included):** Amphenol connector

**Notes**

- Attach the included ferrite core to the cable. Refer to "2.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".
- For details about power failure transfer, refer to "2.11.1 Power Failure Connections".

# Pin Assignments

## Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | RA | SLT Ring port 1 | 26 | TA | SLT Tip port 1 |
| 2 | D2A | PT Data port 1 (Low) | 27 | D1A | PT Data port 1 (High) |
| 3 | Reserved | – | 28 | Reserved | – |
| 4 | RB | SLT Ring port 2 | 29 | TB | SLT Tip port 2 |
| 5 | D2B | PT Data port 2 (Low) | 30 | D1B | PT Data port 2 (High) |
| 6 | Reserved | – | 31 | Reserved | – |
| 7 | RC | SLT Ring port 3 | 32 | TC | SLT Tip port 3 |
| 8 | D2C | PT Data port 3 (Low) | 33 | D1C | PT Data port 3 (High) |
| 9 | Reserved | – | 34 | Reserved | – |
| 10 | RD | SLT Ring port 4 | 35 | TD | SLT Tip port 4 |
| 11 | D2D | PT Data port 4 (Low) | 36 | D1D | PT Data port 4 (High) |
| 12 | Reserved | – | 37 | Reserved | – |
| 13 | RE | SLT Ring port 5 | 38 | TE | SLT Tip port 5 |
| 14 | D2E | PT Data port 5 (Low) | 39 | D1E | PT Data port 5 (High) |
| 15 | Reserved | – | 40 | Reserved | – |
| 16 | RF | SLT Ring port 6 | 41 | TF | SLT Tip port 6 |
| 17 | D2F | PT Data port 6 (Low) | 42 | D1F | PT Data port 6 (High) |
| 18 | Reserved | – | 43 | Reserved | – |
| 19 | RG | SLT Ring port 7 | 44 | TG | SLT Tip port 7 |
| 20 | D2G | PT Data port 7 (Low) | 45 | D1G | PT Data port 7 (High) |
| 21 | Reserved | – | 46 | Reserved | – |
| 22 | RH | SLT Ring port 8 | 47 | TH | SLT Tip port 8 |
| 23 | D2H | PT Data port 8 (Low) | 48 | D1H | PT Data port 8 (High) |
| 24-25 | Reserved | – | 49-50 | Reserved | – |

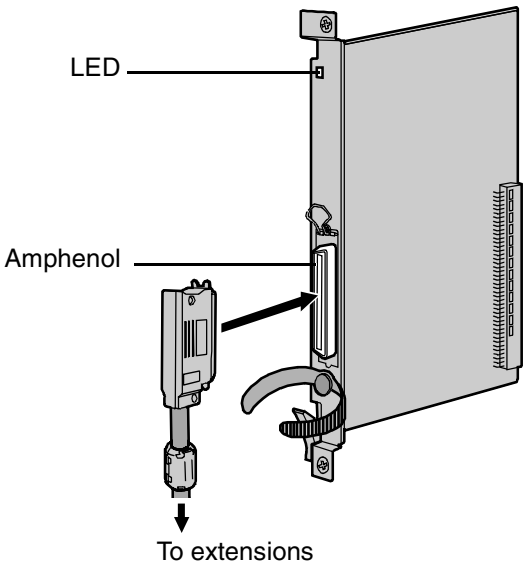
## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/ Orange/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.3 DLC8 Card

## Function

8-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2, Ferrite core × 1

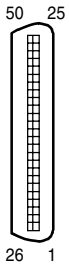
**User-supplied (not included):** Amphenol connector

**Notes**

- Attach the included ferrite core to the cable. Refer to "2.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".

# Pin Assignments

## Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | Reserved | – | 26 | Reserved | – |
| 2 | D2A | Data port 1 (Low) | 27 | D1A | Data port 1 (High) |
| 3-4 | Reserved | – | 28-29 | Reserved | – |
| 5 | D2B | Data port 2 (Low) | 30 | D1B | Data port 2 (High) |
| 6-7 | Reserved | – | 31-32 | Reserved | – |
| 8 | D2C | Data port 3 (Low) | 33 | D1C | Data port 3 (High) |
| 9-10 | Reserved | – | 34-35 | Reserved | – |
| 11 | D2D | Data port 4 (Low) | 36 | D1D | Data port 4 (High) |
| 12-13 | Reserved | – | 37-38 | Reserved | – |
| 14 | D2E | Data port 5 (Low) | 39 | D1E | Data port 5 (High) |
| 15-16 | Reserved | – | 40-41 | Reserved | – |
| 17 | D2F | Data port 6 (Low) | 42 | D1F | Data port 6 (High) |
| 18-19 | Reserved | – | 43-44 | Reserved | – |
| 20 | D2G | Data port 7 (Low) | 45 | D1G | Data port 7 (High) |
| 21-22 | Reserved | – | 46-47 | Reserved | – |
| 23 | D2H | Data port 8 (Low) | 48 | D1H | Data port 8 (High) |
| 24-25 | Reserved | – | 49-50 | Reserved | – |

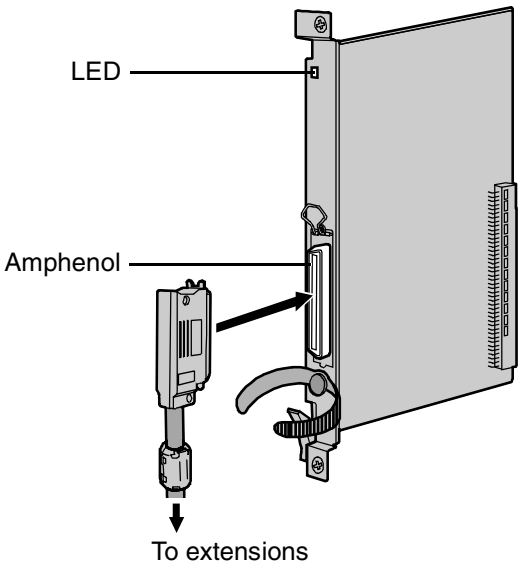
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/ Orange/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.4 DLC16 Card

## Function

16-port digital extension card for DPTs, DSS consoles, and PT-interface CSs.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2, Ferrite core × 1

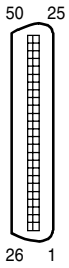
**User-supplied (not included):** Amphenol connector

**Notes**

- Attach the included ferrite core to the cable. Refer to "2.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".

# Pin Assignments

## Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | D2A | Data port 1 (Low) | 26 | D1A | Data port 1 (High) |
| 2 | D2B | Data port 2 (Low) | 27 | D1B | Data port 2 (High) |
| 3 | D2C | Data port 3 (Low) | 28 | D1C | Data port 3 (High) |
| 4 | D2D | Data port 4 (Low) | 29 | D1D | Data port 4 (High) |
| 5 | D2E | Data port 5 (Low) | 30 | D1E | Data port 5 (High) |
| 6 | D2F | Data port 6 (Low) | 31 | D1F | Data port 6 (High) |
| 7 | D2G | Data port 7 (Low) | 32 | D1G | Data port 7 (High) |
| 8 | D2H | Data port 8 (Low) | 33 | D1H | Data port 8 (High) |
| 9 | D2I | Data port 9 (Low) | 34 | D1I | Data port 9 (High) |
| 10 | D2J | Data port 10 (Low) | 35 | D1J | Data port 10 (High) |
| 11 | D2K | Data port 11 (Low) | 36 | D1K | Data port 11 (High) |
| 12 | D2L | Data port 12 (Low) | 37 | D1L | Data port 12 (High) |
| 13 | D2M | Data port 13 (Low) | 38 | D1M | Data port 13 (High) |
| 14 | D2N | Data port 14 (Low) | 39 | D1N | Data port 14 (High) |
| 15 | D2O | Data port 15 (Low) | 40 | D1O | Data port 15 (High) |
| 16 | D2P | Data port 16 (Low) | 41 | D1P | Data port 16 (High) |
| 17-25 | Reserved | – | 42-50 | Reserved | – |

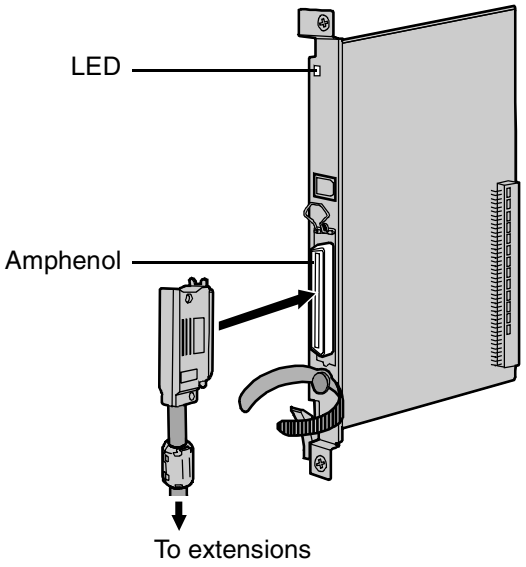
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/ Orange/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Orange Flashing: Detection of PT-interface CS connection (when starting up the PT-interface CS)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.5 SLC8 Card

## Function

8-port extension card for SLTs with 2 power failure transfer (PFT) ports.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 2, Ferrite core × 1

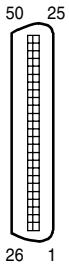
**User-supplied (not included):** Amphenol connector

**Notes**

- Attach the included ferrite core to the cable. Refer to "2.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".
- For details about power failure transfer, refer to "2.11.1 Power Failure Connections".

# Pin Assignments

## Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | RA | Ring port 1 | 26 | TA | Tip port 1 |
| 2-3 | Reserved | – | 27-28 | Reserved | – |
| 4 | RB | Ring port 2 | 29 | TB | Tip port 2 |
| 5-6 | Reserved | – | 30-31 | Reserved | – |
| 7 | RC | Ring port 3 | 32 | TC | Tip port 3 |
| 8-9 | Reserved | – | 33-34 | Reserved | – |
| 10 | RD | Ring port 4 | 35 | TD | Tip port 4 |
| 11-12 | Reserved | – | 36-37 | Reserved | – |
| 13 | RE | Ring port 5 | 38 | TE | Tip port 5 |
| 14-15 | Reserved | – | 39-40 | Reserved | – |
| 16 | RF | Ring port 6 | 41 | TF | Tip port 6 |
| 17-18 | Reserved | – | 43-44 | Reserved | – |
| 19 | RG | Ring port 7 | 44 | TG | Tip port 7 |
| 20-21 | Reserved | – | 45-46 | Reserved | – |
| 22 | RH | Ring port 8 | 47 | TH | Tip port 8 |
| 23-25 | Reserved | – | 48-50 | Reserved | – |

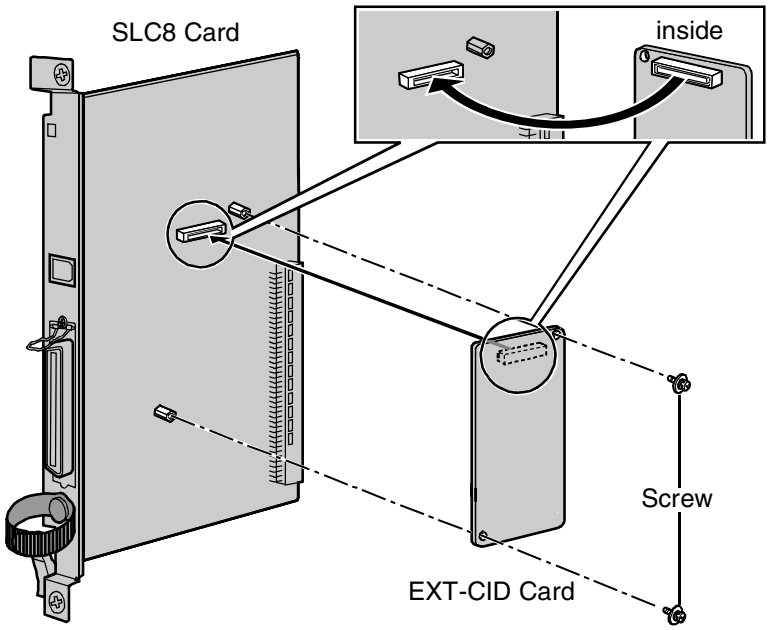
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.6 EXT-CID Card

## Function

Sends Caller ID signals to extension ports. To be mounted on the SLC8 card.




### Accessory and User-supplied Items

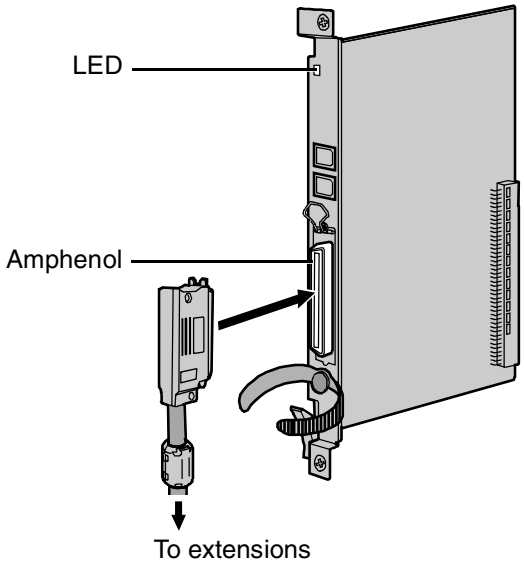
**Accessory (included):** Screws × 2

**User-supplied (not included):** none

# 2.5.7 SLC16 and MSLC16 Cards

## Function

**SLC16:** 16-port extension card for SLTs with 4 power failure transfer (PFT) ports.
**MSLC16:** 16-port extension card for SLTs with Message Waiting Lamp control and 4 power failure transfer (PFT) ports. Maximum output of 145 V/85 V for Message Waiting Lamp control.




### Accessory and User-supplied Items

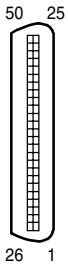
**Accessory (included):** Screws × 2, Ferrite core × 1
**User-supplied (not included):** Amphenol connector

**Notes**

- Panasonic SLT with Message Waiting Lamp (e.g., KX-T7310) is recommended for connection to the MSLC16 card.
- Attach the included ferrite core to the cable. Refer to "2.2.8 Attaching a Ferrite Core".
- To connect the Amphenol connector, refer to "2.2.9 Fastening Amphenol Type Connector".
- For details about power failure transfer, refer to "2.11.1 Power Failure Connections".

# Pin Assignments

### Amphenol Connector




| No. | Signal Name | Function | No. | Signal Name | Function |
|---|---|---|---|---|---|
| 1 | RA | Ring port 1 | 26 | TA | Tip port 1 |
| 2 | RB | Ring port 2 | 27 | TB | Tip port 2 |
| 3 | RC | Ring port 3 | 28 | TC | Tip port 3 |
| 4 | RD | Ring port 4 | 29 | TD | Tip port 4 |
| 5 | RE | Ring port 5 | 30 | TE | Tip port 5 |
| 6 | RF | Ring port 6 | 31 | TF | Tip port 6 |
| 7 | RG | Ring port 7 | 32 | TG | Tip port 7 |
| 8 | RH | Ring port 8 | 33 | TH | Tip port 8 |
| 9 | RI | Ring port 9 | 34 | TI | Tip port 9 |
| 10 | RJ | Ring port 10 | 35 | TJ | Tip port 10 |
| 11 | RK | Ring port 11 | 36 | TK | Tip port 11 |
| 12 | RL | Ring port 12 | 37 | TL | Tip port 12 |
| 13 | RM | Ring port 13 | 38 | TM | Tip port 13 |
| 14 | RN | Ring port 14 | 39 | TN | Tip port 14 |
| 15 | RO | Ring port 15 | 40 | TO | Tip port 15 |
| 16 | RP | Ring port 16 | 41 | TP | Tip port 16 |
| 17-25 | Reserved | – | 42-50 | Reserved | – |

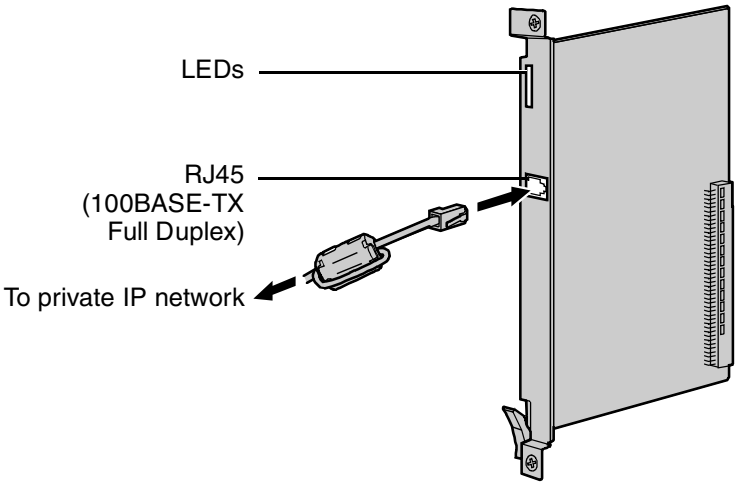
# LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.5.8 IP-EXT16 Card

## Function

16-channel VoIP extension card. Compliant with Panasonic proprietary protocol, and ITU-T G.729a and G.711 CODEC methods.




### Accessory and User-supplied Items

**Accessory (included):** Ferrite core × 1

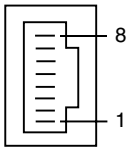
**User-supplied (not included):** RJ45 connector

**Notes**

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- When connecting the RJ45 connector, attach the included ferrite core. Refer to "2.2.8 Attaching a Ferrite Core".

## Pin Assignments

### RJ45 Connector (10BASE-T/100BASE-TX)




| No. | Signal Name | Input (I)/Output (O) | Function |
|---|---|---|---|
| 1 | TPO+ | O | Transmit data+ |
| 2 | TPO- | O | Transmit data- |
| 3 | TPI+ | I | Receive data+ |
| 4-5 | Reserved | – | – |
| 6 | TPI- | I | Receive data- |
| 7-8 | Reserved | – | – |

## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| ONLINE | Green | On-line status indication<br>• ON: At least one port is in use (an IP-PT is connected)<br>• OFF: No ports are in use (No IP-PTs are connected)<br>**Note**<br>If the LINK indicator is OFF, the ONLINE indicator will also be OFF. |
| ALARM | Red | Alarm indication<br>• OFF: Normal<br>• ON: Alarm |
| VoIP BUSY | Green | Panasonic proprietary VoIP protocol process indication<br>• OFF: VoIP process inactive<br>• ON: VoIP process active |
| LINK | Green | Link status indication<br>• OFF: Connection error<br>• ON: Normal connection |
| DATA | Green | Data transmission indication<br>• OFF: No data transmitted<br>• ON: Data transmitting |

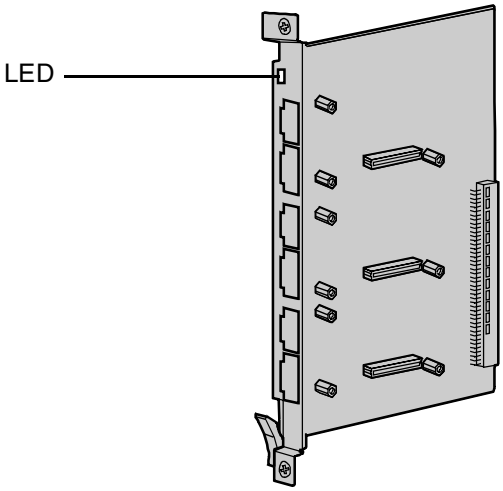
# 2.6 Installation of the Other Cards

## 2.6.1 OPB3 Card

### Function

Optional 3-slot base card for mounting a maximum of 3 option cards from the following:

- DPH4 card
- EIO4 card
- ECHO16 card
- MSG4 card




**CAUTION**

A LITHIUM BATTERY IS USED IN OPB3 CARD. THERE IS A RISK OF EXPLOSION IF BATTERY IS REPLACED WITH THE INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

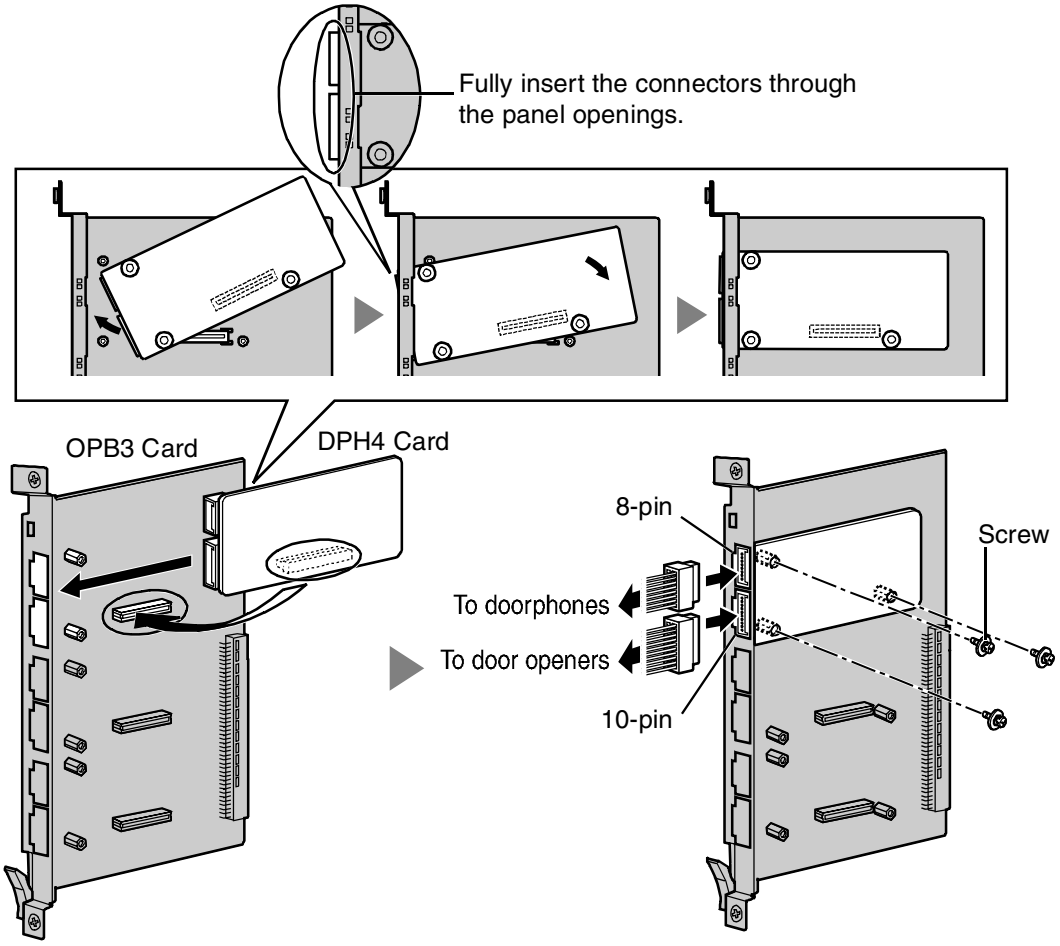
### LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal (all ports are idle)<br>• Green Flashing (60 times per minute): Normal (a port is in use)<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |

# 2.6.2 DPH4 Card

## Function

4-port doorphone card for 4 doorphones and 4 door openers. To be mounted on the OPB3 card.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1

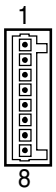
**User-supplied (not included):** Copper wire

**Note**

For details about connection to doorphones and door openers, refer to "2.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

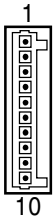
# Pin Assignments

## 8-pin Terminal Block




| No. | Signal Name | Function |
|---|---|---|
| 1 | DP4 | Doorphone 4 transmit |
| 2 | com4 | Doorphone 4 receive |
| 3 | DP3 | Doorphone 3 transmit |
| 4 | com3 | Doorphone 3 receive |
| 5 | DP2 | Doorphone 2 transmit |
| 6 | com2 | Doorphone 2 receive |
| 7 | DP1 | Doorphone 1 transmit |
| 8 | com1 | Doorphone 1 receive |

## 10-pin Terminal Block

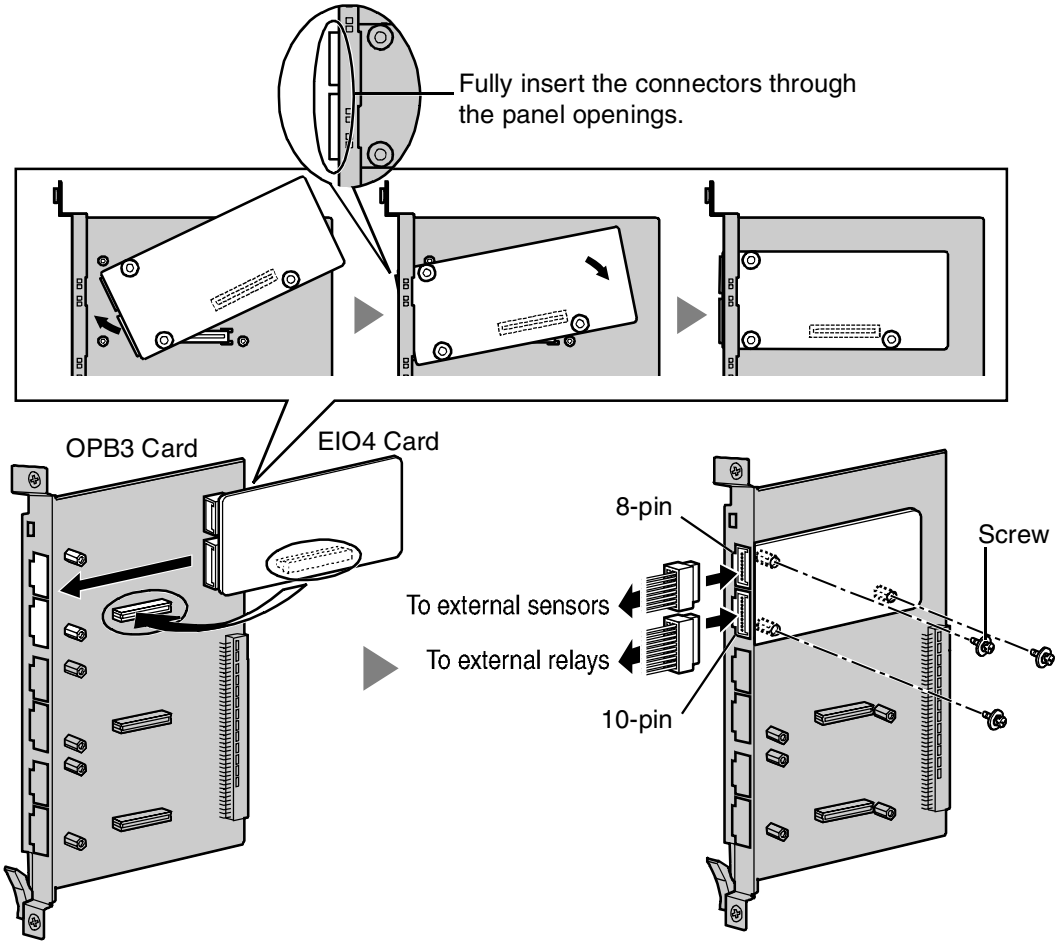



| No. | Signal Name | Function |
|---|---|---|
| 1-2 | Reserved | – |
| 3 | OP4b | Door opener 4 |
| 4 | OP4a | Door opener 4 com |
| 5 | OP3b | Door opener 3 |
| 6 | OP3a | Door opener 3 com |
| 7 | OP2b | Door opener 2 |
| 8 | OP2a | Door opener 2 com |
| 9 | OP1b | Door opener 1 |
| 10 | OP1a | Door opener 1 com |

# 2.6.3 EIO4 Card

## Function

4-port external input/output card. To be mounted on the OPB3 card.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 3, 10-pin terminal block × 1, 8-pin terminal block × 1

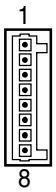
**User-supplied (not included):** Copper wire

**Note**

For details about connection to external sensors and external relays, refer to "2.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays".

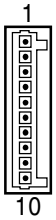
# Pin Assignments

## 8-pin Terminal Block




| No. | Signal Name | Function |
|---|---|---|
| 1 | C4b | Control 4 |
| 2 | C4a | Control 4 com |
| 3 | C3b | Control 3 |
| 4 | C3a | Control 3 com |
| 5 | C2b | Control 2 |
| 6 | C2a | Control 2 com |
| 7 | C1b | Control 1 |
| 8 | C1a | Control 1 com |

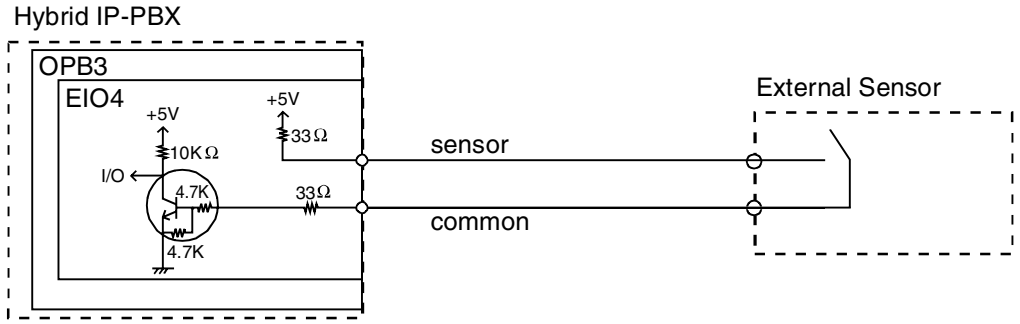
## 10-pin Terminal Block




| No. | Signal Name | Function |
|---|---|---|
| 1-2 | Reserved | – |
| 3 | OP4b | Opener 4 |
| 4 | OP4a | Opener 4 com |
| 5 | OP3b | Opener 3 |
| 6 | OP3a | Opener 3 com |
| 7 | OP2b | Opener 2 |
| 8 | OP2a | Opener 2 com |
| 9 | OP1b | Opener 1 |
| 10 | OP1a | Opener 1 com |

## Connection Diagram for External Sensor

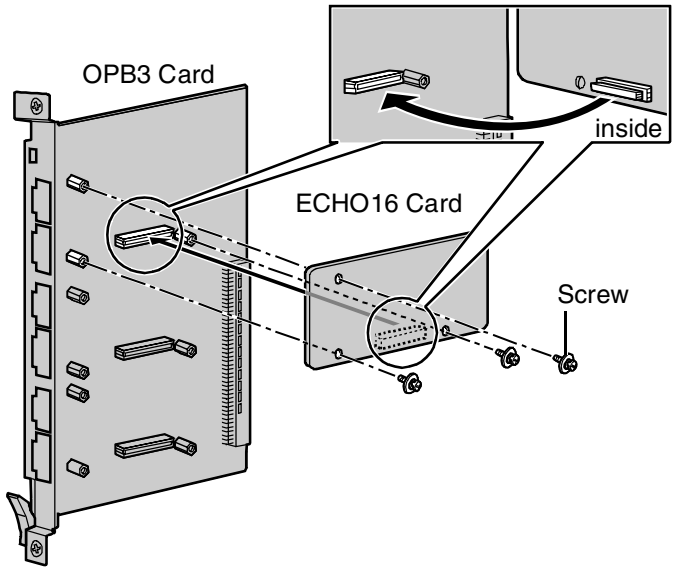
Power to the external sensor is provided from the EIO4 card and must be grounded through the EIO4 card as indicated in the diagram below. A pair of "sensor" and "common" lines are connected to the EIO4 card for each external sensor. The Hybrid IP-PBX detects input from the sensor when the signal is under 100 Ω.



# 2.6.4 ECHO16 Card

## Function

16-channel card for echo cancellation during conferences. To be mounted on the OPB3 card.




### Accessory and User-supplied Items

**Accessory (included):** Screws × 3

**User-supplied (not included):** none

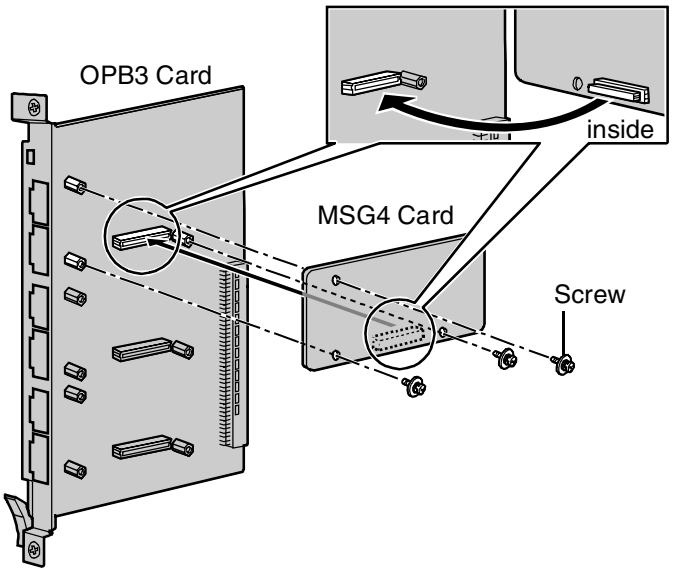
**Note**

To establish a conference call involving 6 to 8 parties, install an ECHO16 card and enable the echo cancellation for conference using the KX-TDA Maintenance Console. For details, refer to the on-line help of the KX-TDA Maintenance Console.

# 2.6.5 MSG4 Card

## Function

4-channel message card. To be mounted on the OPB3 card.




### Accessory and User-supplied Items

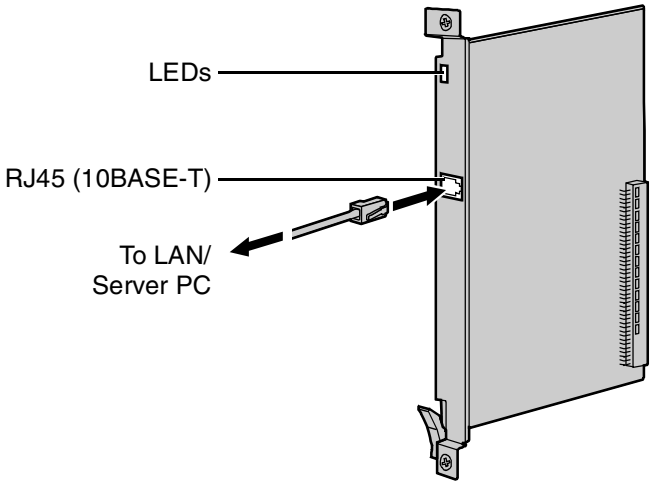
**Accessory (included):** Screws × 3

**User-supplied (not included):** none

# 2.6.6 CTI-LINK Card

## Function

Ethernet card for CTI communication via 10BASE-T port. CSTA Phase 3 protocol compatible.




### Accessory and User-supplied Items

**Accessory (included):** none

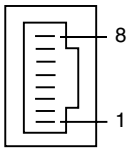
**User-supplied (not included):** RJ45 connector

**Notes**

- The maximum length of the cable to be connected to this optional service card is 100 m (328 ft).
- This optional service card can be connected to PCs on a LAN via a Server PC to provide third party call control CTI.
  The operating system of the PC or Server PC required for third party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.

## Pin Assignments

### RJ45 Connector (10BASE-T)



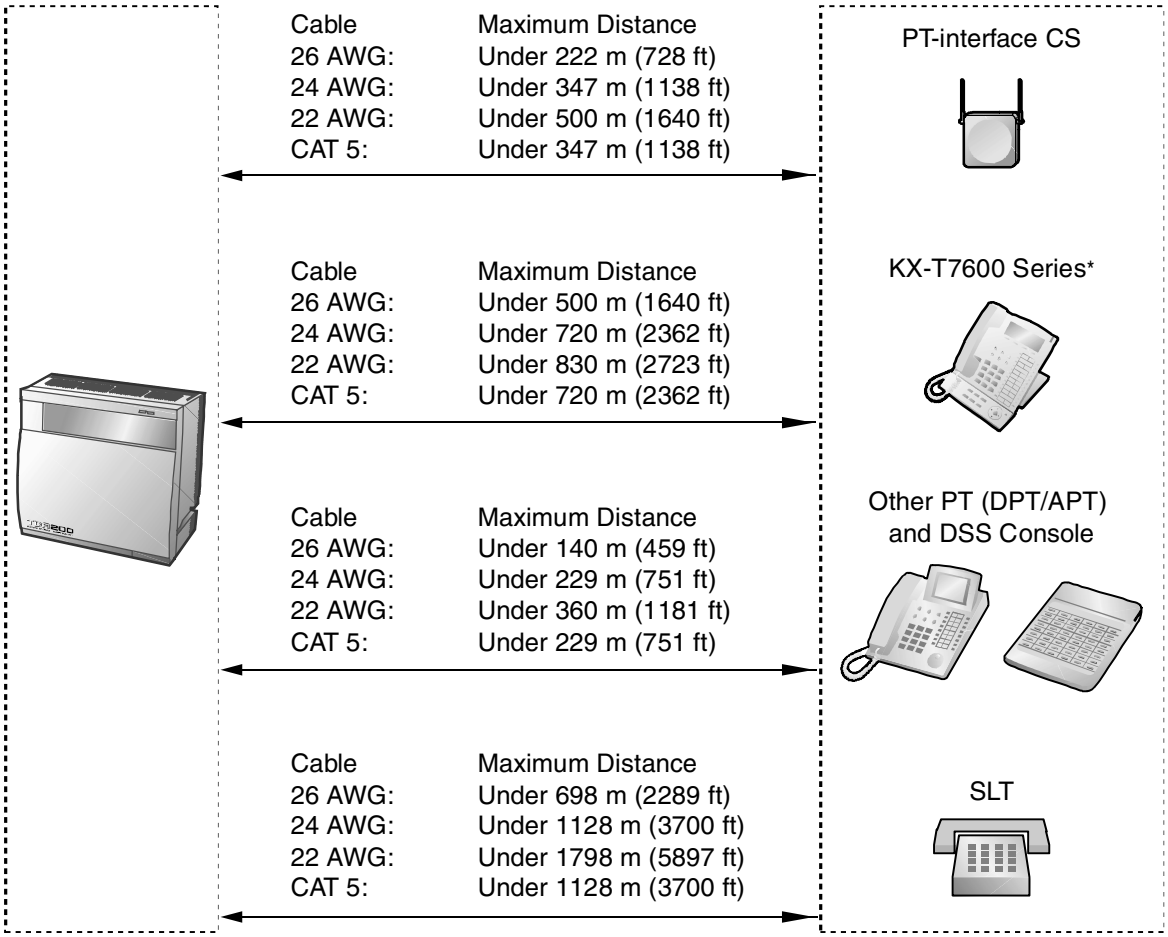

| No. | Signal Name | Input (I)/Output (O) | Function |
|---|---|---|---|
| 1 | TPO+ | O | Transmit data+ |
| 2 | TPO- | O | Transmit data- |
| 3 | TPI+ | I | Receive data+ |
| 4-5 | Reserved | – | – |
| 6 | TPI- | I | Receive data- |
| 7-8 | Reserved | – | – |

## LED Indications

| Indication | Color | Description |
|---|---|---|
| CARD STATUS | Green/Red | Card status indication<br>• OFF: Power Off<br>• Green ON: Normal<br>• Red ON: Fault (includes reset)<br>• Red Flashing (60 times per minute): Out of Service |
| LINK STATUS | Green | Link status indication<br>• Flashing: In communication<br>• ON: In normal linking |

# 2.7 Connection of Extensions

## 2.7.1 Maximum Cabling Distances of the Extension Wiring (Twisted Cable)




* The maximum cabling distance from the Hybrid IP-PBX is the same even when the KX-T7600 series DPT is the master DPT on the Digital XDP connection.

**Notice**

The maximum cabling distance may vary depending on the conditions.

| | PT-interface CS | DPT | APT | DSS Console | SLT |
|---|---|---|---|---|---|
| DHLC8 Card | ✔ | ✔ | ✔ | ✔ | ✔ |
| MSLC16, SLC16, SLC8 Cards | | | | | ✔ |
| DLC16, DLC8 Cards | ✔ | ✔ | | ✔ | |

" ✔" indicates that the extension card is available for the terminal.

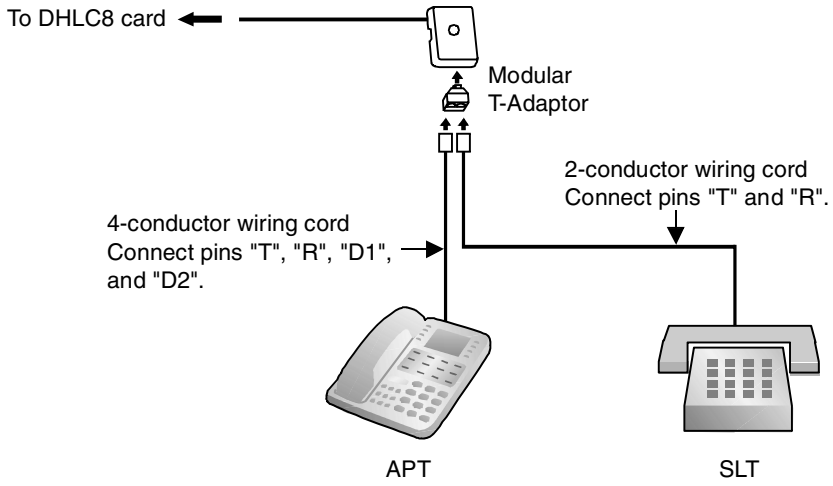
## 2.7.2 Parallel Connection of the Extensions

Any SLT can be connected in parallel with an APT or a DPT as follows.

**Note**

In addition to an SLT, an answering machine, a fax machine or a modem (PC) can be connected in parallel with an APT or a DPT.

### With APT

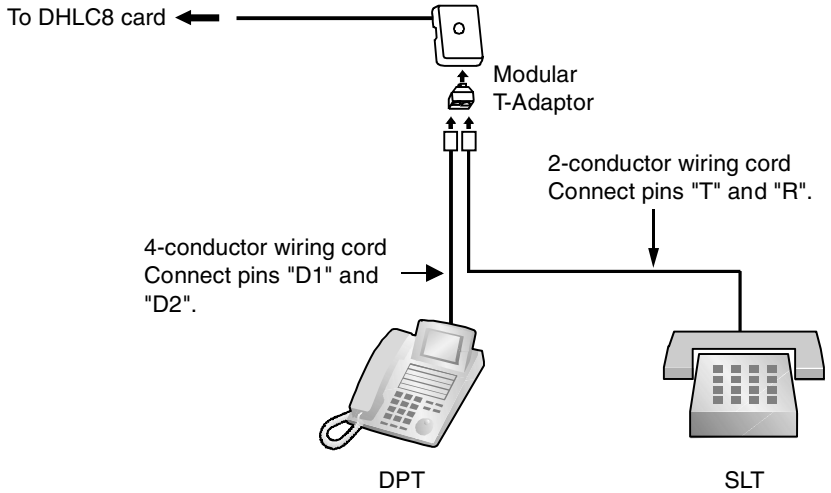



### With DPT

Parallel mode or eXtra Device Port (XDP) mode can be selected through system programming.

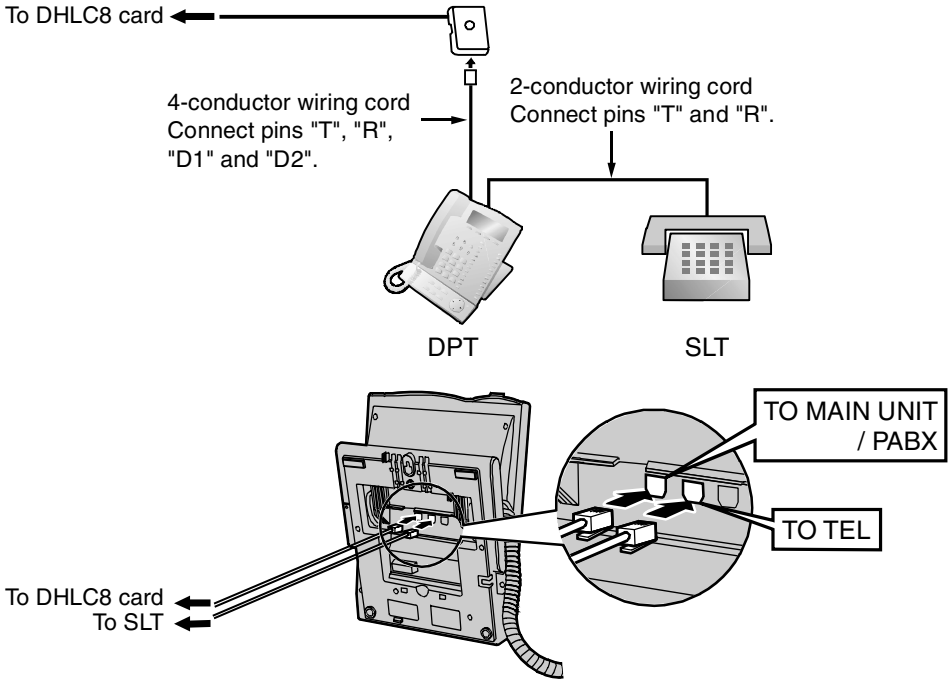
If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "1.10.9 Paralleled Telephone" and "2.1.1 Extension Port Configuration" in the Feature Guide for further information.

#### Using a Modular T-Adaptor

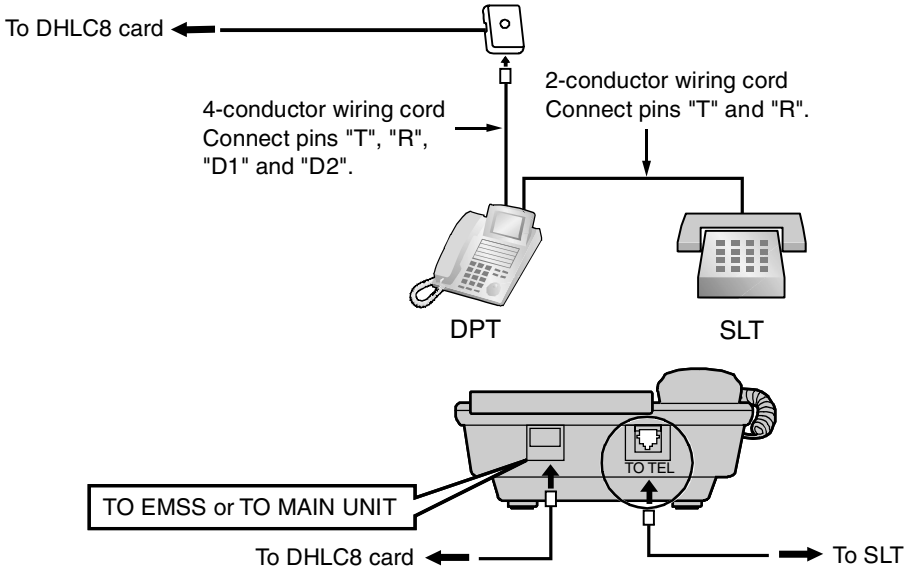


## Using an EXtra Device Port

### With KX-T7600 Series DPT




### With Other DPT



# 2.7.3 Digital EXtra Device Port (Digital XDP) Connection

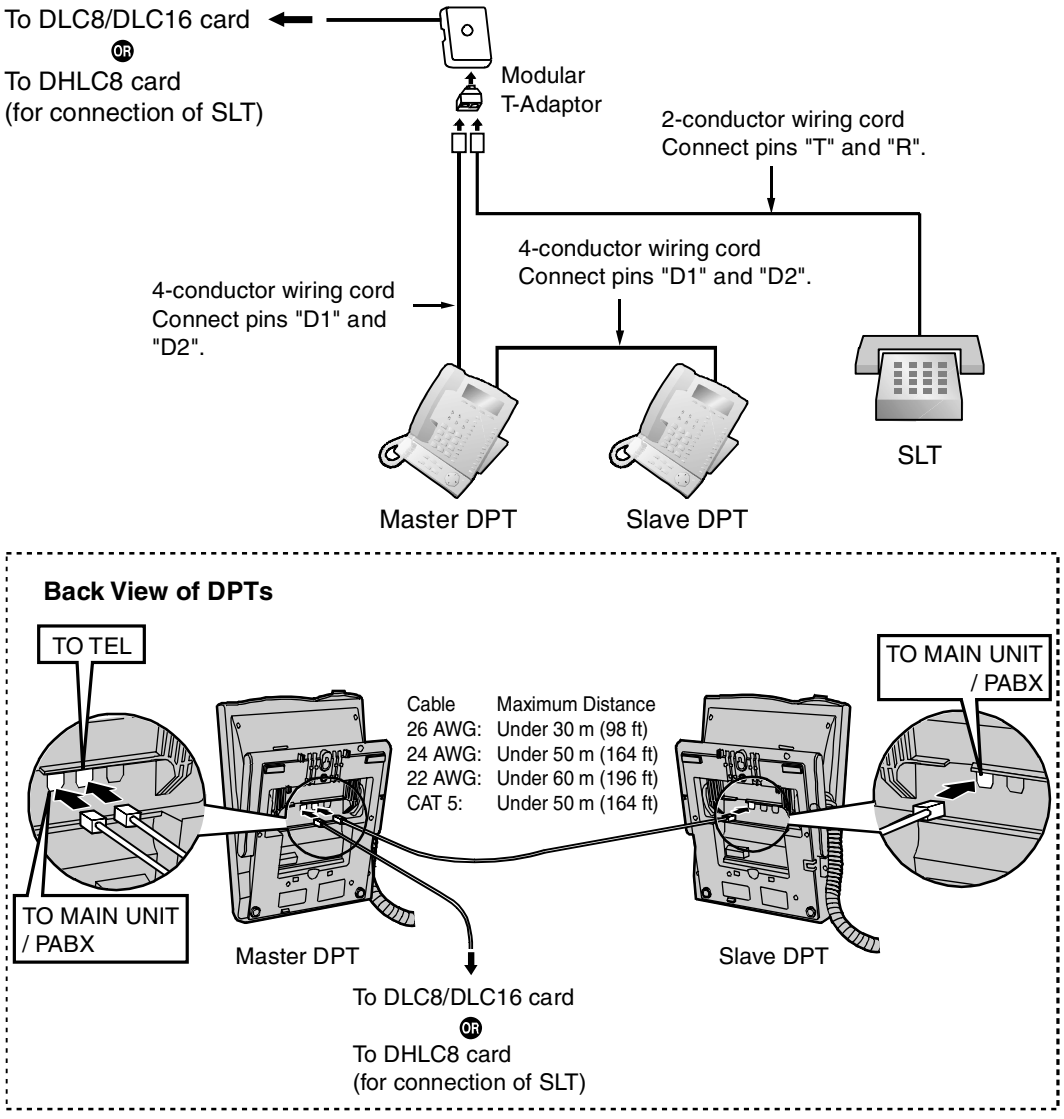
A DPT can be connected to another DPT on the Digital XDP connection. In addition, if the DPT is connected to a DHLC8 card, it can also have an SLT connected in Parallel mode or XDP mode.

**Notes**

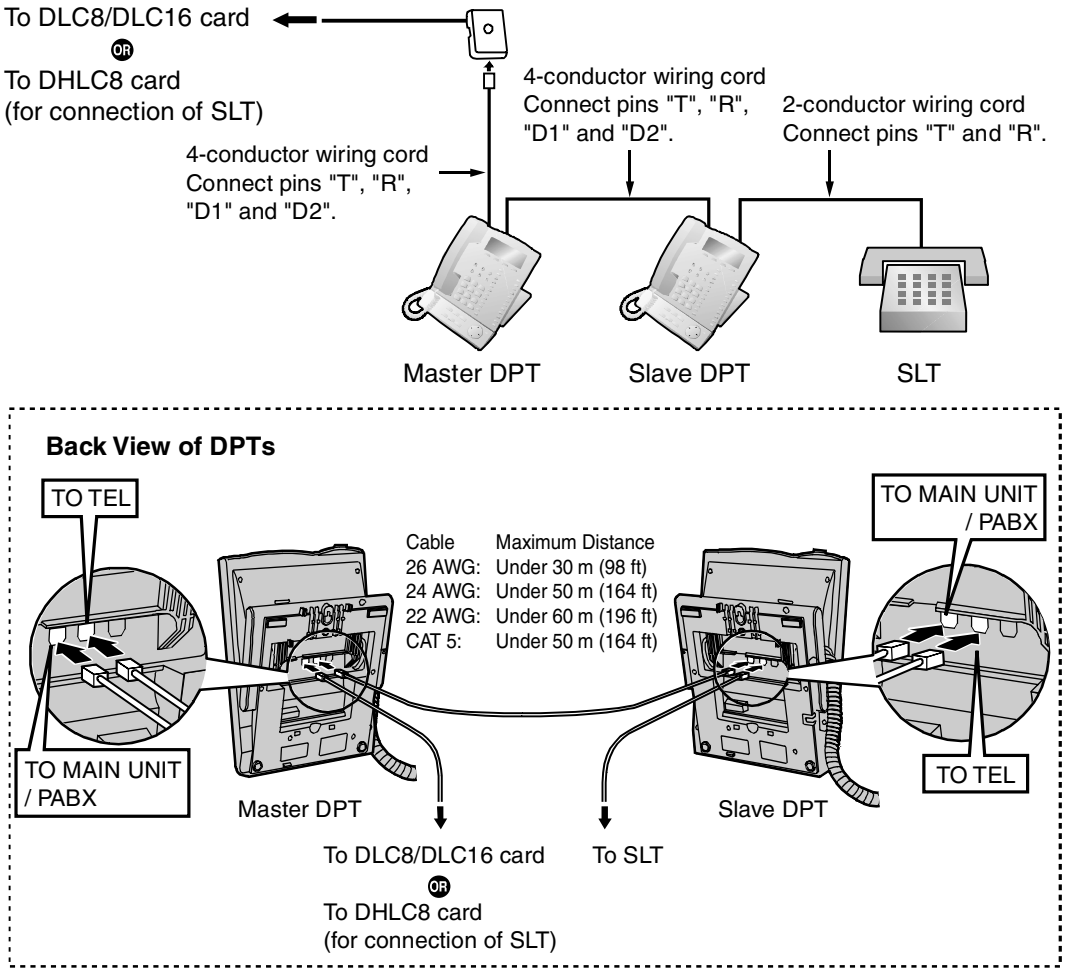
- Both DPTs must be KX-T7600 series DPTs (excluding KX-T7640).
- Parallel mode or XDP mode can be selected through system programming.
- If XDP mode is enabled through system programming, parallel connection is not possible. Refer to "1.10.9 Paralleled Telephone" and "2.1.1 Extension Port Configuration" in the Feature Guide for further information.

## With KX-T7600 Series DPT

### Using a Modular T-Adaptor



## Using an EXtra Device Port



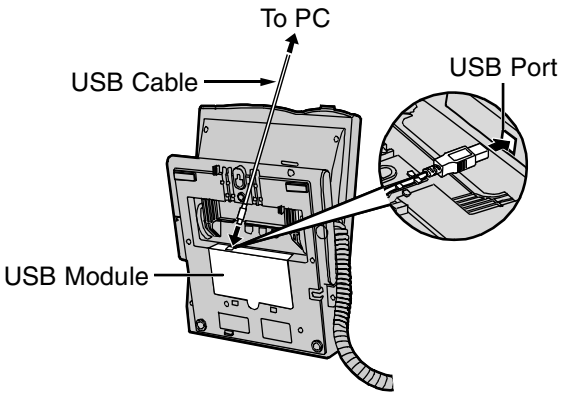
## 2.7.4 First Party Call Control CTI Connection

CTI connection between a PC and a KX-T7633/T7636 DPT provides the first party call control. The CTI connection is made via USB interface (version 1.1), and uses the TAPI 2.1 protocol.

A USB Module (KX-T7601) must be connected to the KX-T7633/T7636 DPT.

**Note**

The operating system of the PC required for first party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.




**Notes**

- The maximum length of the USB cable is 3 m (9 ft 10 in).
- USB Modules must not be connected to DPTs in the Digital XDP connection. In a Digital XDP connection, the PC cannot be used. If a USB module is connected to a slave DPT, the DPT will not work properly.

# 2.8 Connection of 2.4 GHz Portable Stations

## 2.8.1 Overview

The following equipment is required to connect the wireless system:

### CS: Cell Station (KX-TDA0142/KX-T0141)

#### KX-TDA0142 Using a CSIF Card

This unit determines the area covered by the wireless system. Up to 3 calls can be made at the same time through each CS.

- **CSIF4 (KX-TDA0143)**
  One CSIF4 card supports up to 4 Cell Stations. Up to 2 CSIF4 cards can be installed in the KX-TDA100, and up to 4 can be installed in the KX-TDA200.
- **CSIF8 (KX-TDA0144)**
  One CSIF8 card supports up to 8 Cell Stations. Up to 2 CSIF8 cards can be installed in the KX-TDA100, and up to 4 can be installed in the KX-TDA200.

#### KX-T0141 Using a DHLC/DLC Card

This unit determines the area covered by the wireless system. Up to 2 calls can be made at the same time through each CS.

### PS: 2.4 GHz Portable Station (KX-TD7680/KX-TD7690)

The KX-TDA100 and KX-TDA200 can support up to 128 PSs. For more details about the PS, refer to the PS Operating Instructions.

**CAUTION**

- The CS should be kept free of dust, moisture, high temperature (more than 40 °C [104 °F]), low temperature (less than 0 °C [32 °F]), vibration, and should not be exposed to direct sunlight.
- The CS should not be placed outdoors (use indoors).
- The CS should not be placed near high voltage equipment.
- The CS should not be placed on a metal object.
- Systems using 2.4 GHz ISM (Industrial, Scientific and Medical) band may interfere with the KX-TDA wireless system. Examples of such systems are cordless telephones, wireless LAN, Home RF, microwave ovens and other ISM devices. These systems may cause minor noise.
- Keeping some distance between the equipment listed below may prevent interference. (The distance may vary depending on the environment.)

| Equipment | Distance |
|---|---|
| CS and office equipment such as a computer, telex, fax machine, etc. | More than 2 m (6 ft 7 in) |
| CS and PS | More than 1 m (3 ft 3 in) |
| Each PS | More than 0.5 m (1 ft 8 in) |
| Hybrid IP-PBX and CS | More than 2 m (6 ft 7 in) |
| CS and CS | More than 15 m (49 ft) |

Please take into consideration the distance between the CSs when site planning. Please consult a certified dealer for details.
However, the required distance between CSs may vary depending on the environment of the installation site and conditions in which the wireless system is used. Conduct the site survey to determine the appropriate distance.

## 2.8.2 Procedure Overview

When connecting the wireless system, use extreme care to conduct a site survey. Inadvertent site survey can result in narrow service area, frequent noise, and disconnection of calls.

### 1. Investigate the installation site

Refer to "2.8.3 Site Planning".

**a.** Obtain the map of the CS installation site.

**b.** Consider the service area demanded by the user on the map.

**c.** Plan the locations of each CS, taking account of distance, building materials and etc.

### 2. Prepare the CS for site survey

Refer to "2.8.4 Before Site Survey".

**a.** Assign a CS number to each CS by setting the DIP switches on the back of the CS.

**b.** Supply electricity to each CS using an AC adaptor or a battery box.

**c.** Install each CS temporarily as planned.

**Notes**

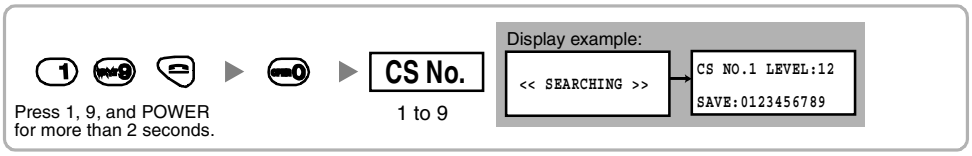
- Install at least 2 m (6 ft 7 in) above the floor.
- Keep the antennas in the upright positions.

### 3. Conduct the site survey

Refer to "2.8.5 Site Survey".

**a.** Test the radio signal strength using the PS.
Confirm that the radio signal strength level is "12" near the CS.

**Using the KX-TD7680**




**Using the KX-TD7690**

**b.** By walking away from the CS with the PS, check the radio signal strength. The radio signal strength weakens as you walk away from the CS.

**c.** Map the CS coverage area at radio signal strength levels "3" and "8".

**d.** Make sure that adjacent CS coverage areas overlap where the radio signal strength level is "8" by at least 5 m (16 ft).

**e.** Make sure that the radio signal strength level is greater than "3" at any location within the service area demanded by the user.

## 4. Finish the site survey

Refer to "2.8.6 After Site Survey".

**a.** Return all DIP switches of each CS to the OFF position, and stop supplying electricity.

**b.** Turn off the PS.

## 5. Connect the CS and PS to the Hybrid IP-PBX and test the operation

Refer to "2.8.7 Connecting a Cell Station to the Hybrid IP-PBX".

**a.** Connect the CSs to the Hybrid IP-PBX.

**b.** Register the PSs to the Hybrid IP-PBX.

**c.** Walk around the service area while having a conversation using a registered PS. If noise is frequent or conversations disconnect, relocate the CSs or install an additional CS.

## 6. Mount the CS on the wall

Refer to "2.8.8 Wall Mounting".

**a.** If everything assuredly goes as planned, mount the CS on the wall.

# 2.8.3 Site Planning

Choosing the best site for the CS requires careful planning and testing of essential areas. The best location may not always be convenient for installation. Read the following information before installing the unit.

## Understanding the Radio Waves

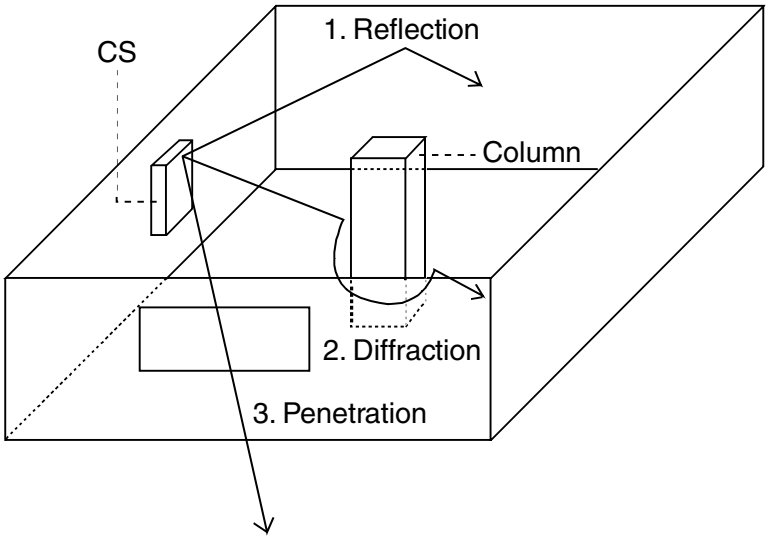
### Characteristics of Radio Waves

The transmission of radio waves and the CS coverage area depend on the structure and materials of the building.

Office equipment, such as computers and fax machines, can interfere with radio waves. Such equipment may create noise or interfere with the performance of the PS.

The illustration below shows the special transmitting patterns of radio waves.

1. Radio waves are reflected by objects such as those made of metal.
2. Radio waves are diffracted by objects such as metallic columns.
3. Radio waves penetrate objects such as those made of glass.




### Relationships Between Radio Waves and Building Structure and Materials

- The CS coverage area is affected more by the building materials and their thickness than the number of obstacles.
- Radio waves tend to be reflected or diffracted by conductive objects and rarely penetrate them.
- Radio waves tend to penetrate insulated objects and are rarely reflected by them.
- Radio waves penetrate thin objects more than thick objects.
- The table below shows the transmission tendency of radio waves when they reach objects made from various materials.

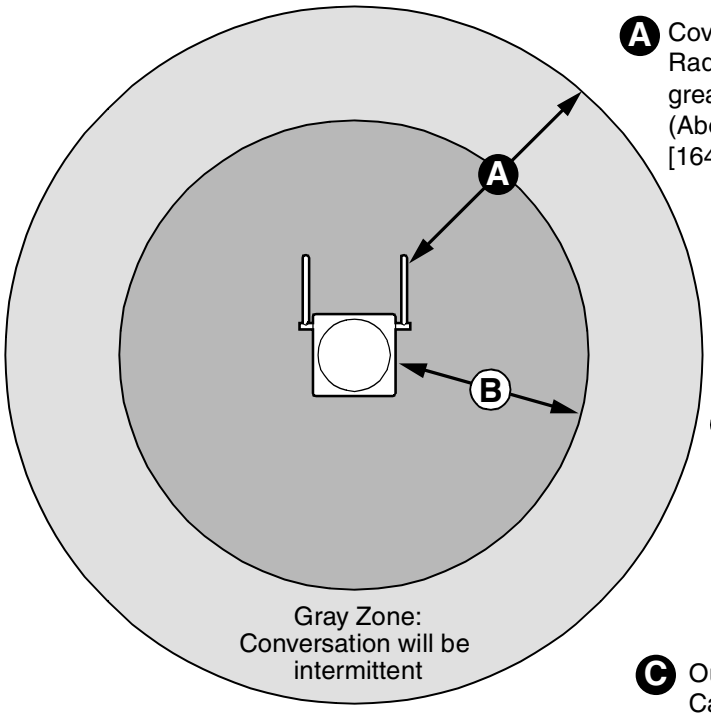
| Object | Material | Transmission Tendency |
|---|---|---|
| Wall | Concrete | The thicker they are, the less radio waves penetrate them. |
| | Ferroconcrete | Radio waves can penetrate them, but the more iron there is, the more radio waves are reflected. |
| Window | Glass | Radio waves usually penetrate them. |
| | Glass with wire nets | Radio waves can penetrate them, but tend to be reflected. |
| | Glass covered with heat-resistant film | Radio waves are weakened considerably when they penetrate windows. |
| Floor | Ferroconcrete | Radio waves can penetrate them, but the more iron there is, the more radio waves are reflected. |
| Partition | Steel | Radio waves are reflected and rarely penetrate them. |
| | Plywood, Glass | Radio waves usually penetrate them. |
| Column | Ferroconcrete | Radio waves can penetrate them, but the more iron there is, the more radio waves tend to be reflected or diffracted. |
| | Metal | Radio waves tend to be reflected or diffracted. |
| Cabinet | Steel | Radio waves are usually reflected or diffracted, and rarely penetrate them. |
| | Wood | Radio waves can penetrate them, but they are weakened. |

## CS Coverage Area

The example below shows the size of the coverage area of 1 CS if it is installed where there is no obstacle.

**Note**

Radio signal strength levels are measured during the site survey (refer to "2.8.5 Site Survey").




A Coverage Area
Radio signal strength level is greater than "3".
(About 50 m to 60 m [164 ft to 197 ft])

B Good Coverage Area
Radio signal strength level is greater than "8".
(About 30 m to 40 m [98 ft to 131 ft])
Good conversation will be kept.

Gray Zone:
Conversation will be intermittent

C Out of Service:
Cannot make/receive calls

**Radio Signal Strength Levels**

| | |
|---|---|
| Level: 00 | Out of range |
| Level: 01 to 02 | Receives noise easily or disconnects |
| Level: 03 to 07 | May receive noise |
| Level: 08 to 10 | Good |
| Level: 11 to 12 | Better |

## Site Survey Preparation

1. Obtain the map and investigate the installation site.
   - **a.** Check the obstacles (e.g., shelves, columns, and partitions).
   - **b.** Check the materials of the structures (e.g., metal, concrete, and plywood).
   - **c.** Check the layout and dimensions of the room, corridor, etc.
   - **d.** Write down the above information to the map.
2. Examine the service area demanded by the user on the map, referring to the following example.
   - **a.** Draw the coverage area around a CS. Extend the coverage area to 30 to 60 meters (98 to 197 feet) in one direction, depending on the materials of the building structures and obstacles in the installation site. Note that a CS cannot be installed outside a building.
   - **b.** If one CS cannot cover the entire service area, install additional CSs as required. Overlap the coverage areas of adjacent CSs.
     Where CS coverage areas overlap, the PS will start call handover to the next CS if the signal from

one CS becomes weak. However, if a PS moves away from a CS and there are no CSs available for handover, the PS may go out of range and the call could be lost.
If the signal from the CS fades, due to the structure of the building, there may be some handover delay. The user will hear a range warning before handover in this case. This also applies in the case of interference from 2.4 GHz apparatus.

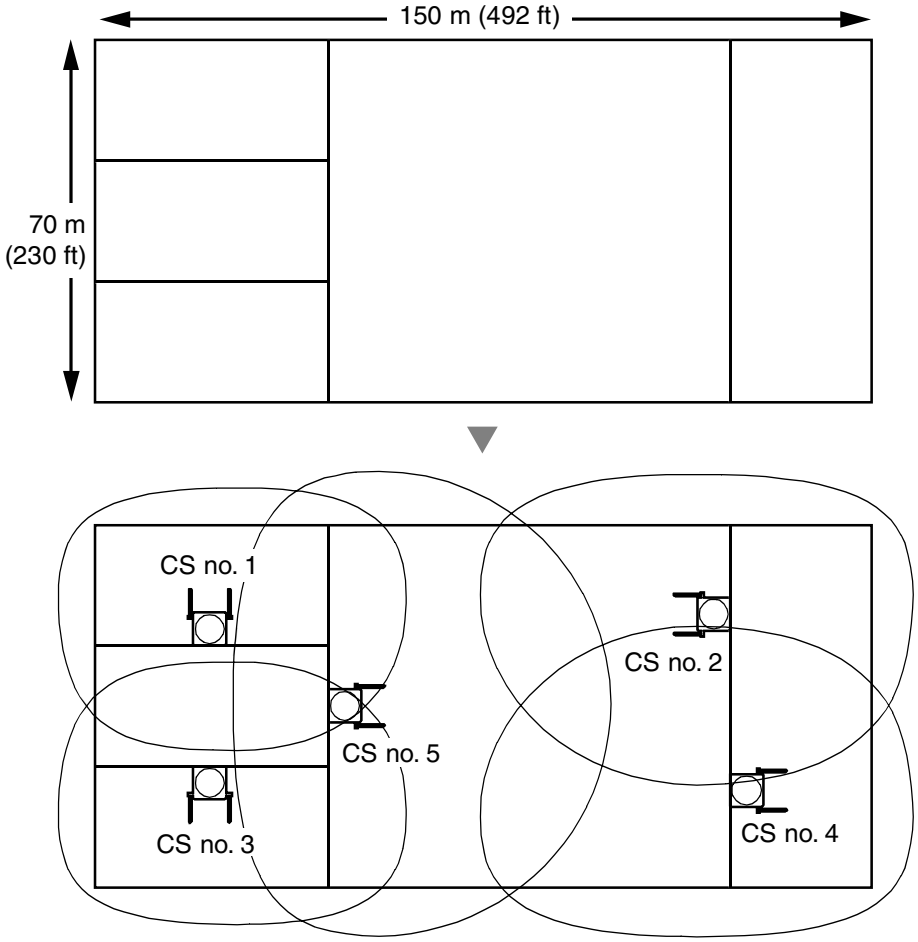
### Example: Installing in a Room Separated by Walls

**Things to take note of:**

- The room is separated by walls.
- The room is surrounded by concrete walls.

**CS installation plan:**

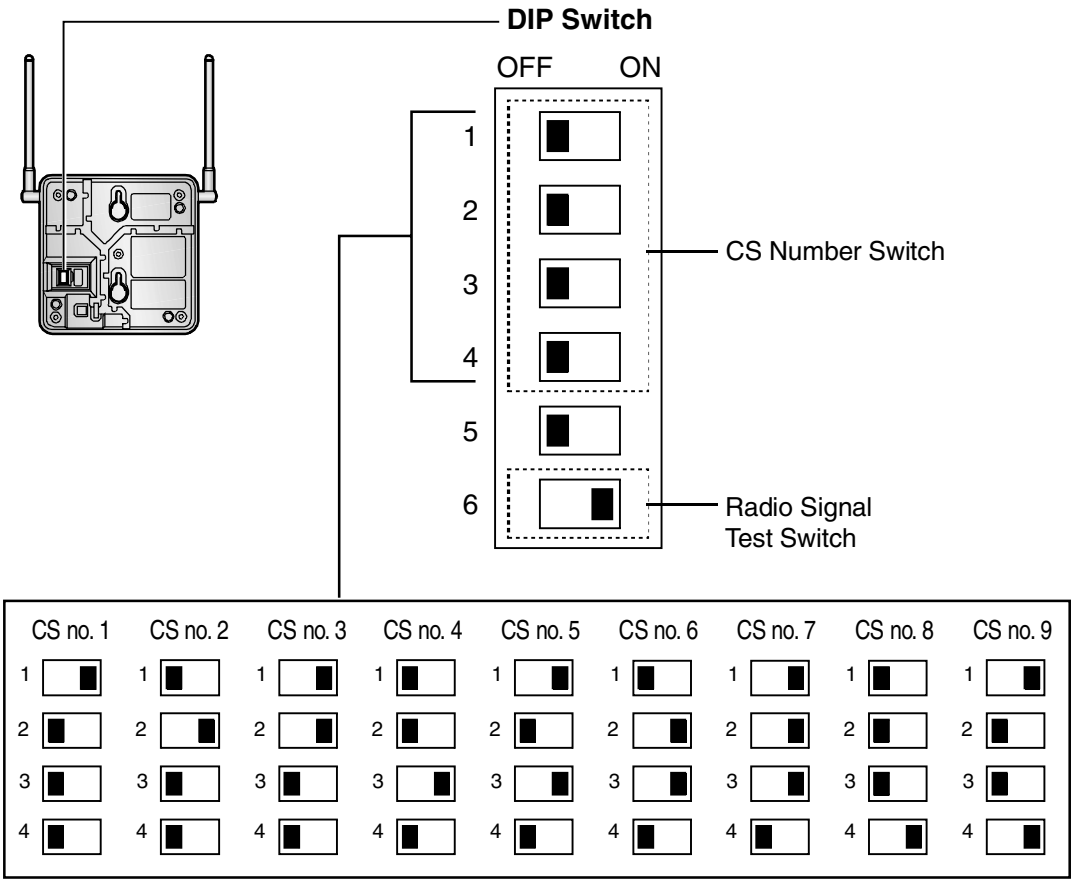
- The coverage area of each CS will not extend as much it does where there is no obstacle, because the radio signals will be weakened by separating walls. Therefore, you will need 5 CSs to cover the entire room.



## 2.8.4 Before Site Survey

### Setting and Installing the CS Temporarily for Site Survey

1. Switch the Radio Signal Test switch from OFF to ON.
2. Set the CS number switches as desired.



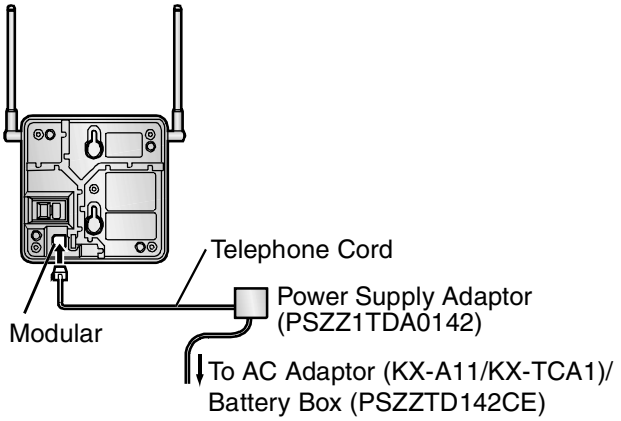

**Notes**

- To see the radio signal strength of more than 1 CS, a CS number must be set for each CS.
- If more than 1 CS is in Radio Signal Test mode, each CS must have a unique CS number.

**3.** After setting the DIP switch, connect an AC adaptor or battery box to the CS using a power supply adaptor.

**Note**

The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.




**4.** Install the CS temporarily for the site survey. Install the CS at least 2 m (6 ft 7 in) above the floor, keeping the antennas in the upright positions.

# 2.8.5 Site Survey

The PS has a Radio Signal Test mode that monitors the state of the radio link to the CS. After installing the CSs temporarily, set the PS to the Radio Signal Test mode and measure each CS coverage area. Then, record the results on the map of the installation site.

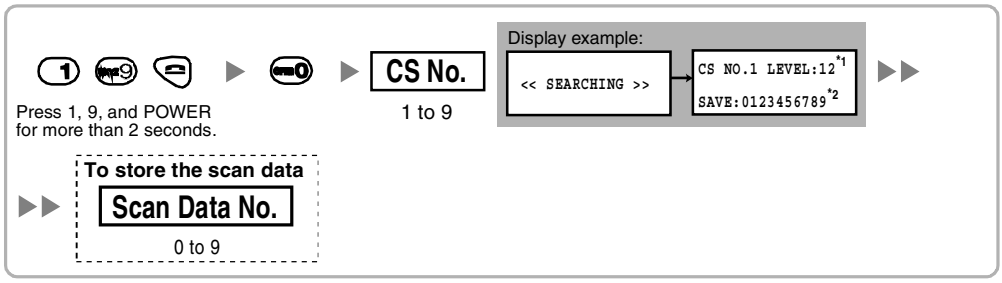
## Testing the Radio Signal Strength

**Note**

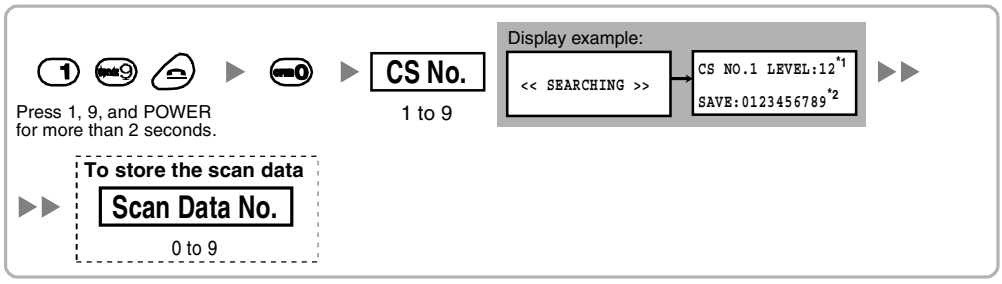
The display language for the site survey is available only in English.

**1.** Enter the Radio Signal Test mode.

**Using the KX-TD7680**




**Using the KX-TD7690**




**Notes**

*1: CS number and radio signal strength level.

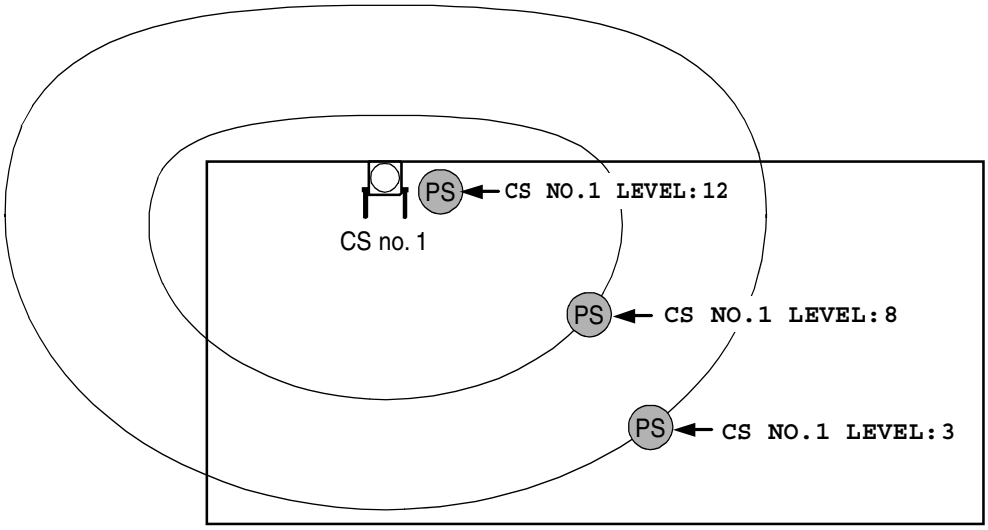
*2: Scan data (test result) number. Empty memory space will be indicated by a number; stored memory space will be indicated by a "-".

**2.** Measure the radio signal strength by moving to and away from the CS.

**a.** Move to the CS until the point the radio signal strength level becomes "12".

**b.** Move away from the CS and identify the CS coverage area within which the radio signal strength level is greater than "8". Draw the area on the map.

**c.** Move away from the CS and identify the CS coverage area within which the radio signal strength level is greater than "3". Draw the area on the map.

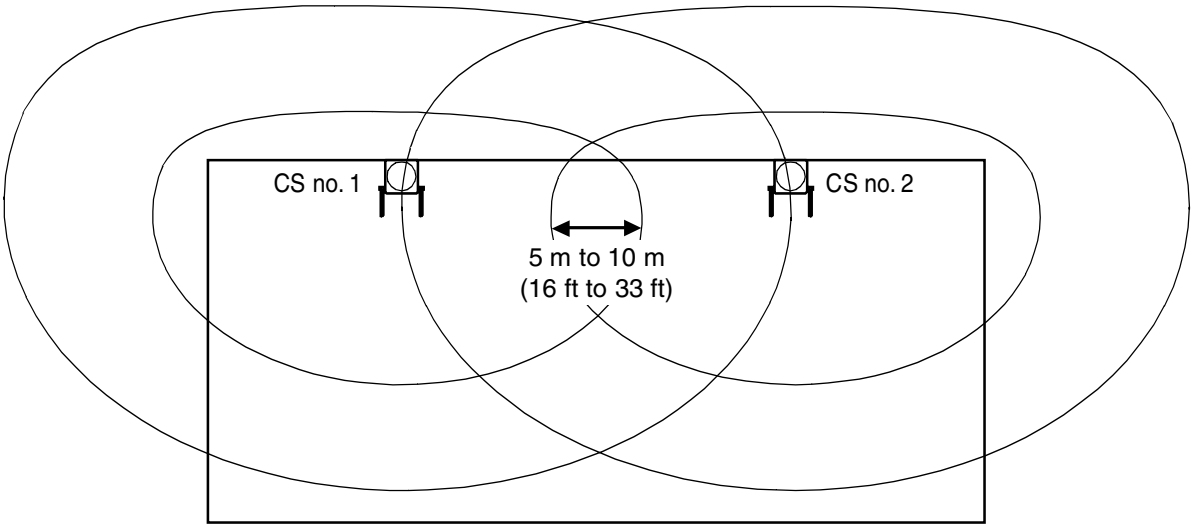



**Radio Signal Strength Levels**

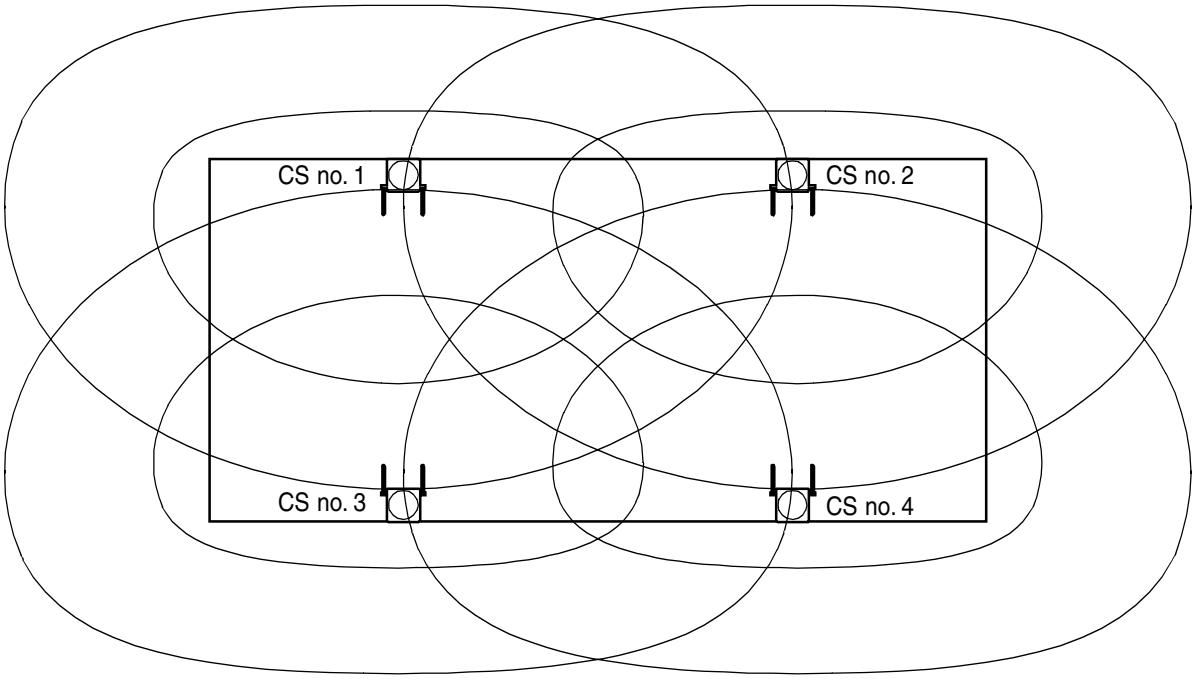
| | |
|---|---|
| Level: 00 | Out of range |
| Level: 01 to 02 | Receives noise easily or disconnects |
| Level: 03 to 07 | May receive noise |
| Level: 08 to 10 | Good |
| Level: 11 to 12 | Better |

**3.** Repeat the steps 1 and 2 for other CSs, and relocate the CSs when necessary.

**a.** Overlap adjacent CS coverage areas where the radio signal strength level is "8" by 5 to 10 meters (16 to 33 feet).



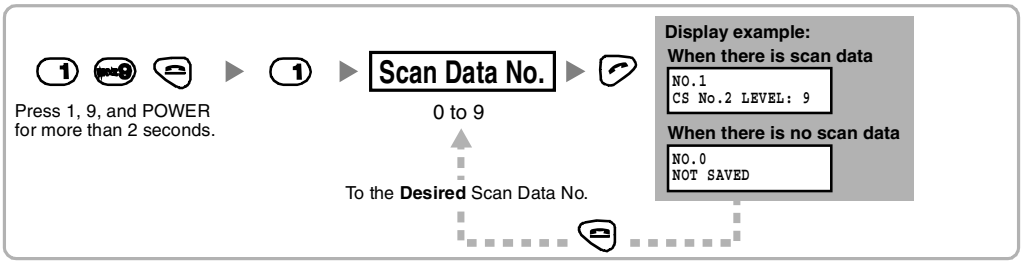
**b.** Overlap the CS coverage areas of at least 2 CSs at any location in the installation site.



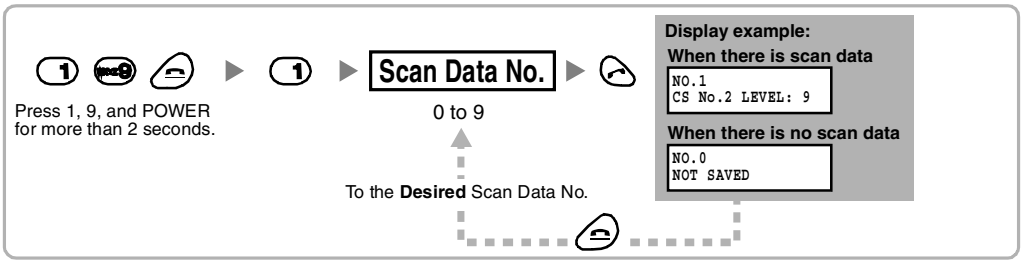

**c.** Make sure that the radio signal strength level is greater than "3" at any location in the service area demanded by the user.

## Referring the Stored Scan Data

### Using the KX-TD7680

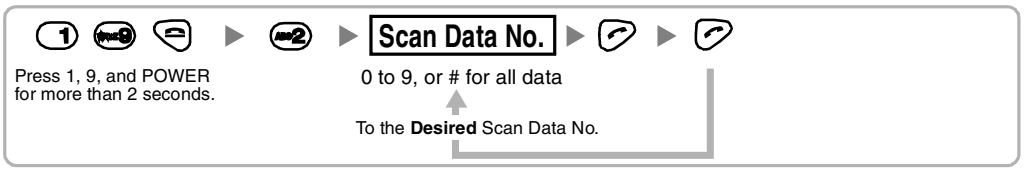



### Using the KX-TD7690

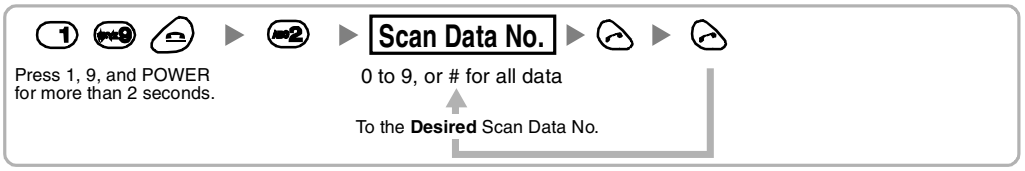


# Deleting the Stored Scan Data

### Using the KX-TD7680



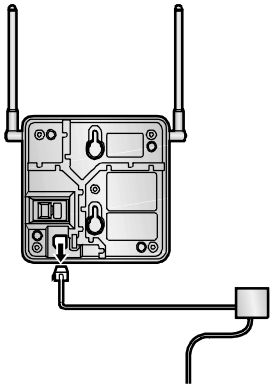

### Using the KX-TD7690



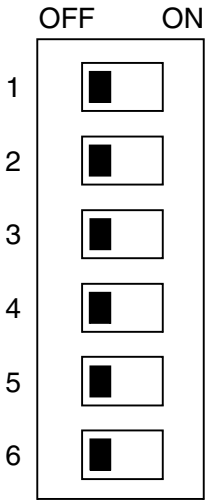
## 2.8.6 After Site Survey

After obtaining the proper measurement results, exit the Radio Signal Test mode before connecting the CS to the Hybrid IP-PBX.

1. Keep pressing POWER button on the PS until the PS is turned OFF.
2. Disconnect the AC adaptor or battery box from the CS and stop supplying electricity.



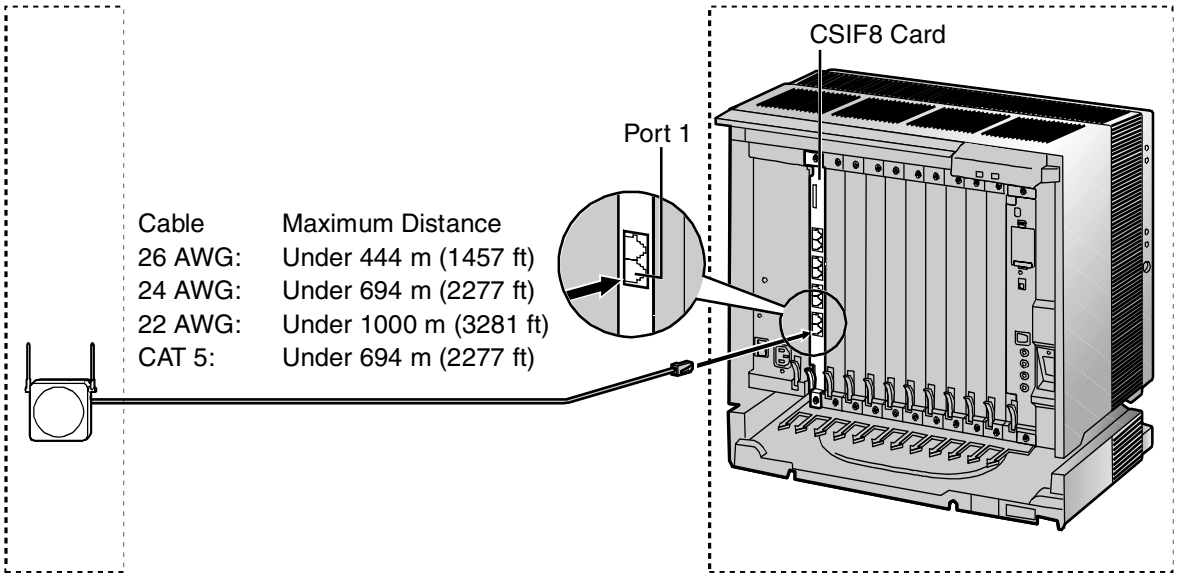
3. Switch all DIP switches on the CS from ON to OFF.



# 2.8.7 Connecting a Cell Station to the Hybrid IP-PBX

### Using a CSIF Card

Refer to the following example to connect a CS to the Hybrid IP-PBX.


CSIF8 Card
Port 1
Cable Maximum Distance
26 AWG: Under 444 m (1457 ft)
24 AWG: Under 694 m (2277 ft)
22 AWG: Under 1000 m (3281 ft)
CAT 5: Under 694 m (2277 ft)

CS (RJ11)

| Signal Name | Pin No. |
|---|---|
| D1 | 1 |
| POWH | 2 |
| POWL | 3 |
| D2 | 4 |

CSIF card (RJ45)

| Pin No. | Signal Name |
|---|---|
| 1 | |
| 2 | |
| 3 | D1 |
| 4 | POWH |
| 5 | POWL |
| 6 | D2 |
| 7 | |
| 8 | |

### Accessory and User-supplied Items for the CS

**Accessory (included):** Screws × 2, Washers × 2

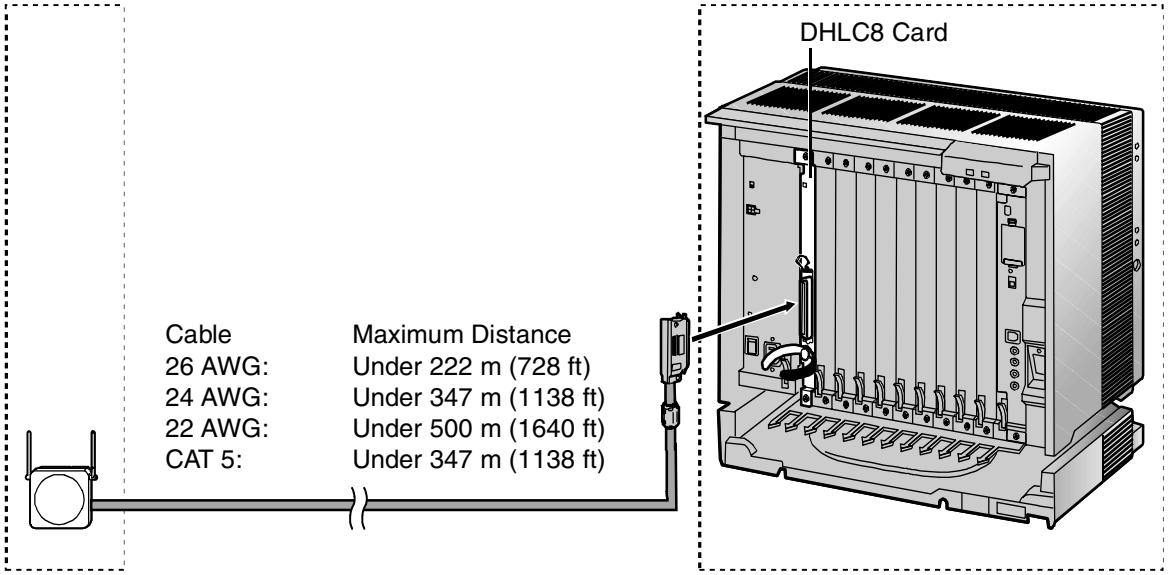
**User-supplied (not included):** RJ11 connector

**Note**

For details about CSIF card, refer to "2.5.1 CSIF4 and CSIF8 Card".

### Using a DHLC/DLC Card

Refer to the following example to connect a CS to the Hybrid IP-PBX.




CS (RJ11)

| Signal Name | Pin No. |
|---|---|
| D1 | 1 |
| | 2 |
| | 3 |
| D2 | 4 |

DHLC/DLC card (Amphenol)

| Signal Name |
|---|
| D1 |
| D2 |

### Accessory and User-supplied Items for the CS

**Accessory (included):** Screws × 2, Washers × 2

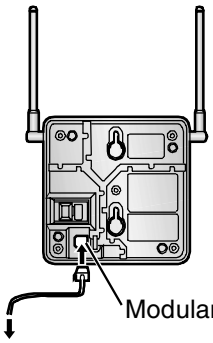
**User-supplied (not included):** RJ11 connector

**Note**

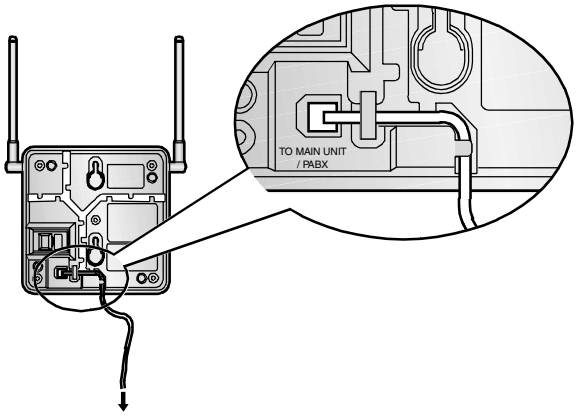
For details about DHLC card or DLC card, refer to "2.5.2 DHLC8 Card", "2.5.3 DLC8 Card", or "2.5.4 DLC16 Card".

## Connecting the CS

1. Connect the cable from the CSIF/DHLC/DLC card to the CS.




2. Pass the cable through the groove of the CS (in any direction depending on your convenience).



# Registering the PS

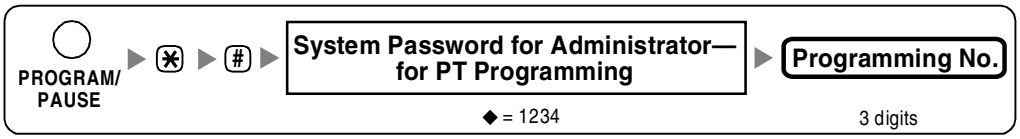
The PS must be registered to the Hybrid IP-PBX before it can be used. Programming of both the PS and Hybrid IP-PBX is required. A PT with multiline display (e.g., KX-T7636 6-line display) is required for the Hybrid IP-PBX system programming.

**Note**

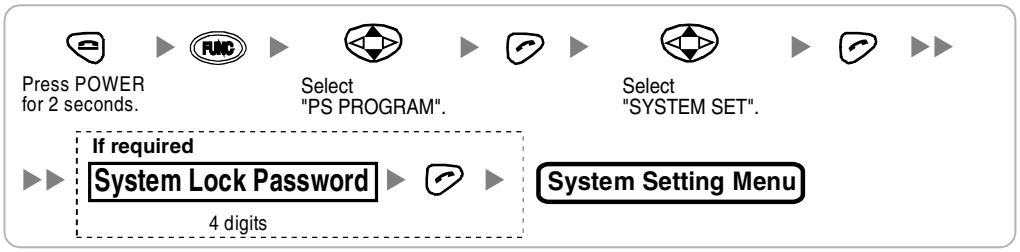
For details about system programming using a PT, refer to "2.3.2 PT Programming" and "3.3 PT Programming" in the Feature Guide.

## Entering the System Programming Mode

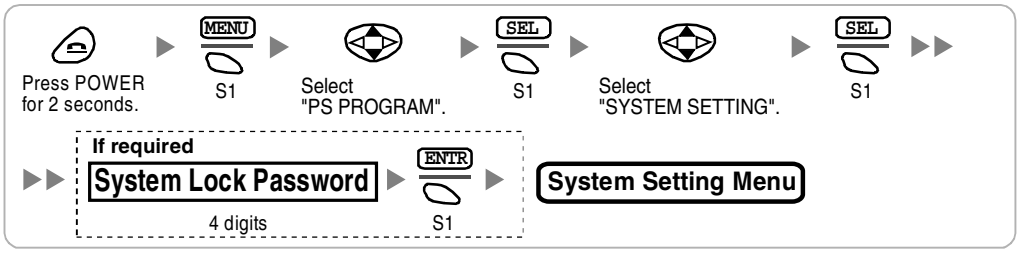
### PT (Administrator Level)




### PS (Using the KX-TD7680)



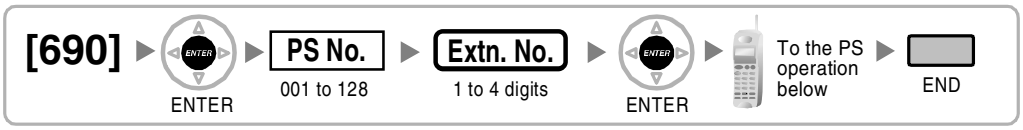

### PS (Using the KX-TD7690)




**Note**

◆ means default value throughout this section.

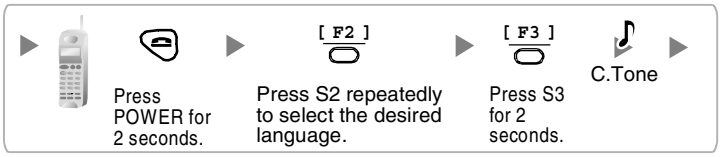
## PS Registration



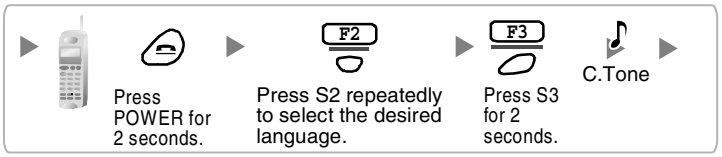

### When the PS has not been registered yet

When registering the PS for the first time, it is possible to select the desired language for the display. (You do not need to enter the PS system programming mode when registering for the first time.)

**Using the KX-TD7680**



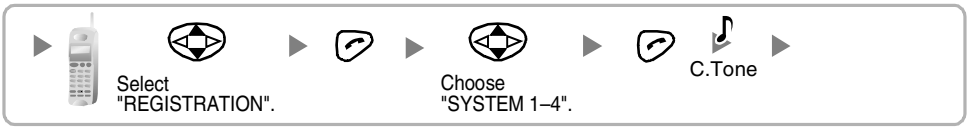

**Using the KX-TD7690**



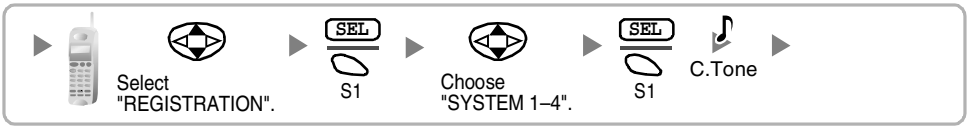

### When the PS has already been registered to another Hybrid IP-PBX

One PS can be registered to a maximum of 4 different Hybrid IP-PBXs.

**Using the KX-TD7680**



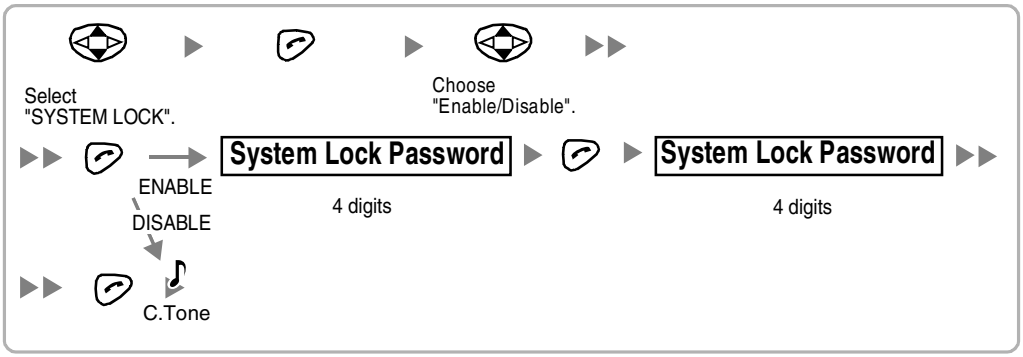

**Using the KX-TD7690**



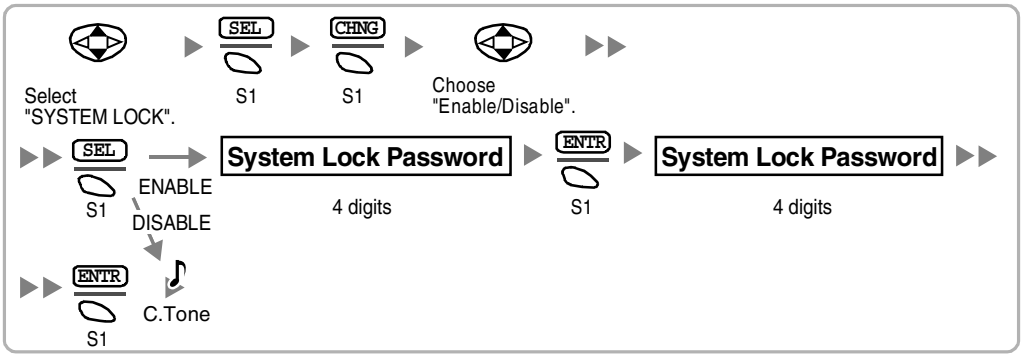
## Setting the System Lock

When a system lock has been set, the system lock password will be required for PS system setting.

### Using the KX-TD7680




### Using the KX-TD7690



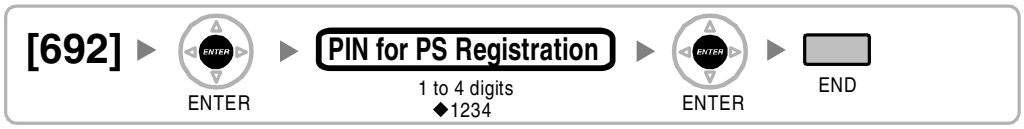
## Setting the Personal Identification Number (PIN) for PS Registration

To prevent registering the PS to a wrong Hybrid IP-PBX, a PIN for PS registration can be set to the Hybrid IP-PBX. Before registering the PS to the Hybrid IP-PBX, register the PIN set to the Hybrid IP-PBX into the PS. By doing so, the PS will only be registered to the Hybrid IP-PBX with the matching PIN.

**Notes**

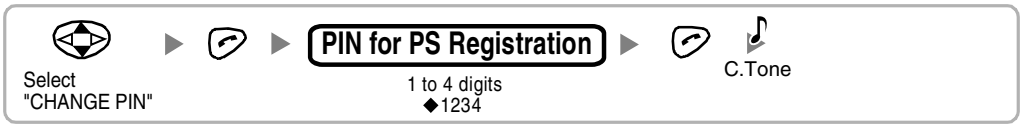
- By default, the PIN for PS registration is "1234" for both the Hybrid IP-PBX and PS. Therefore, the PS can be registered to the Hybrid IP-PBX without setting the PIN.
- The PIN for PS registration will only be used when registering the PS to the Hybrid IP-PBX. Therefore, even when there is more than 1 Hybrid IP-PBX with the same PIN near the PS, the PS will not be linked to a different Hybrid IP-PBX during normal operation after registration.

**Setting the PIN for Hybrid IP-PBX**

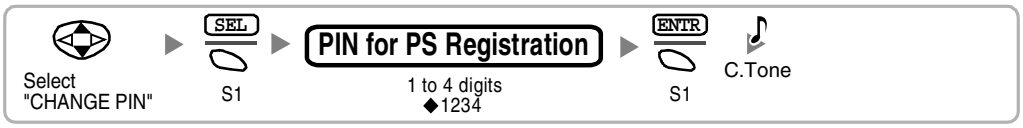



**Setting the PIN for PS**

**Using the KX-TD7680**



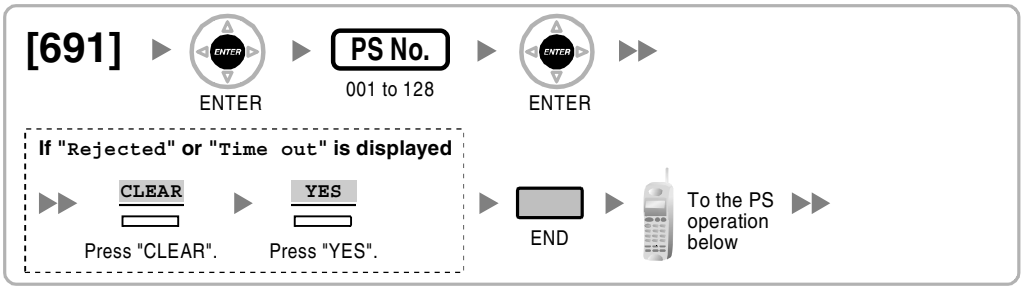

**Using the KX-TD7690**



### PS Termination

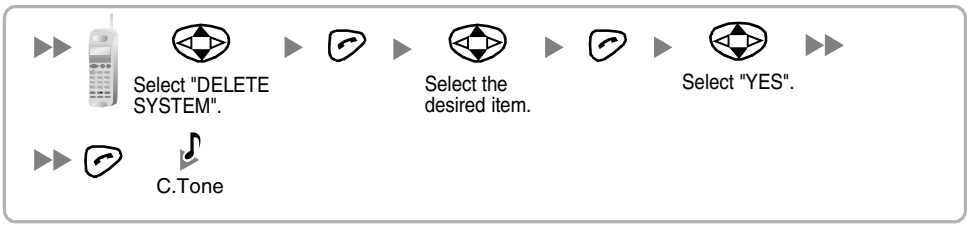
Confirm the following before canceling the PS registration:

- PS is turned on.
- PS is within the range.

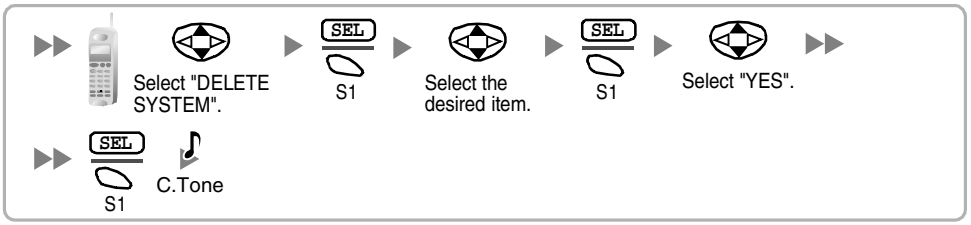



**If the registration information is still stored in the PS**

**Using the KX-TD7680**




**Using the KX-TD7690**




## Testing the Operation

Walk around the service area while having a conversation using a registered PS. If noise is frequent or conversations disconnect, relocate the CSs or install an additional CS.

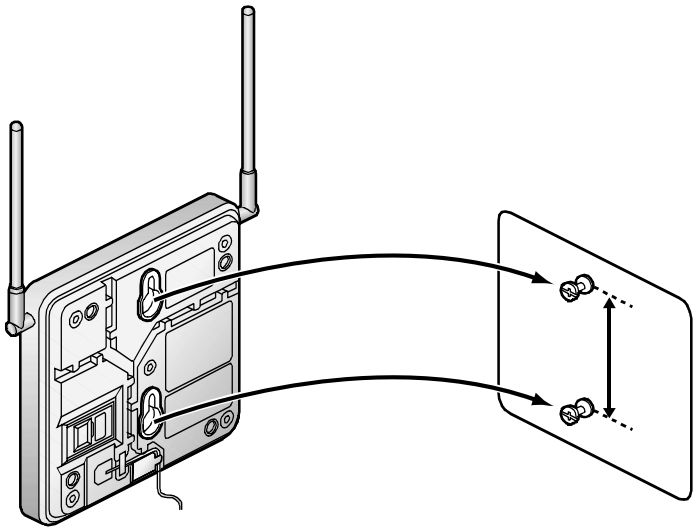
## 2.8.8 Wall Mounting

1. Place the reference for wall mounting (on the following page) on the wall to mark the 2 screw positions.
2. Install the 2 screws and washers (included) into the wall.

**Notes**

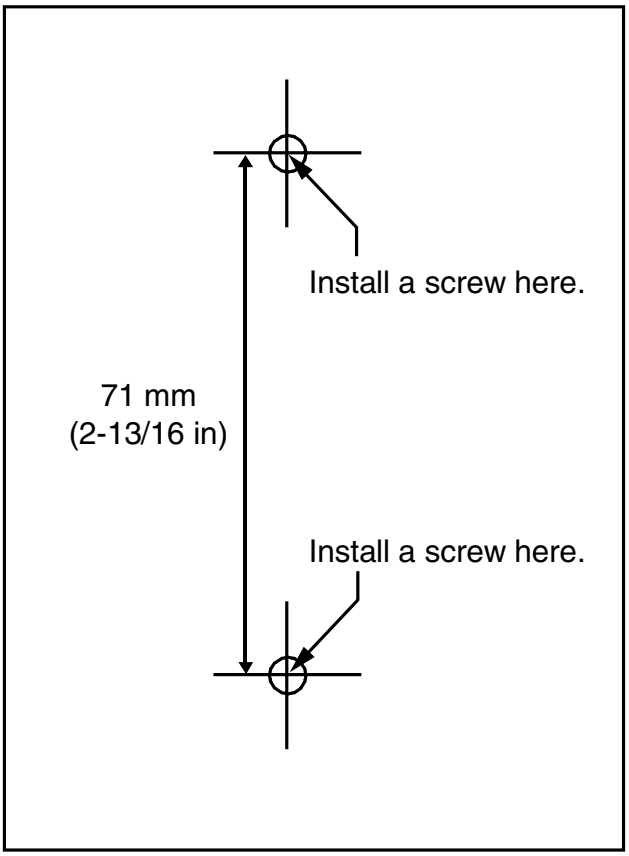
- Make sure that the screw heads are at the same distance from the wall.
- Install the screws perpendicular to the wall.

3. Hook the CS on the screw heads.



## Reference for Wall Mounting

Please copy this page and use as a reference for wall mounting.




**Note**

Make sure to set the print size to correspond with the size of this page. If the dimension of the paper output still deviates slightly from the measurement indicated here, use the measurement indicated here.

# 2.9 Connection of Doorphones, Door Openers, External Sensors, and External Relays

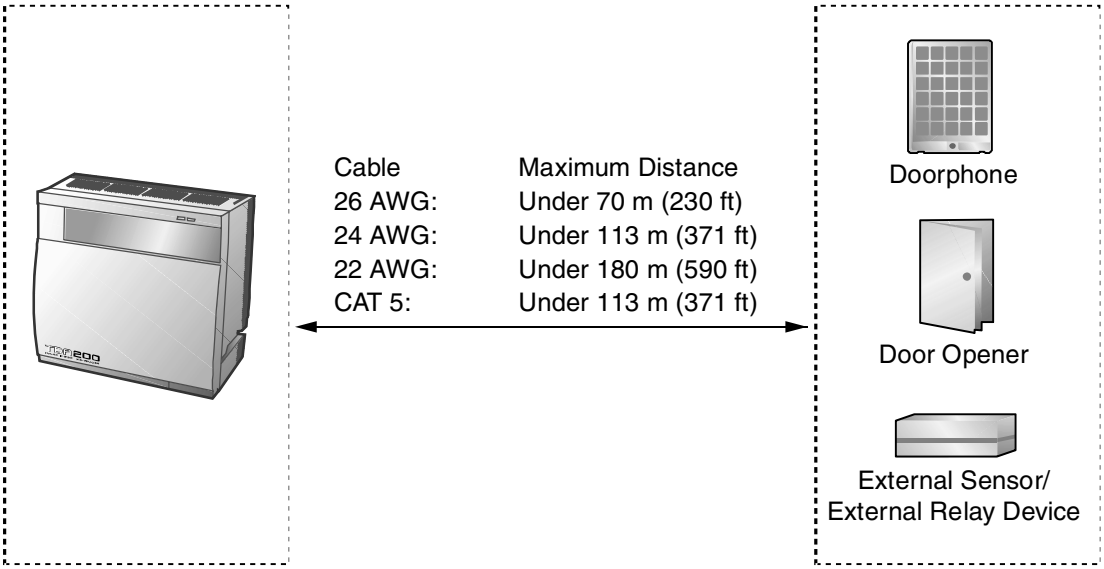
## 2.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

The KX-TDA100 supports a maximum of 8 doorphones, 8 door openers, 8 external sensors, and 8 external relays.
The KX-TDA200 supports a maximum of 16 doorphones, 16 door openers, 16 external sensors, and 16 external relays.

**Note**

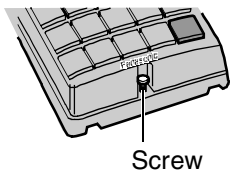
Doorphones, door openers, external sensors, and external relays are user-supplied.

### Maximum Cabling Distance

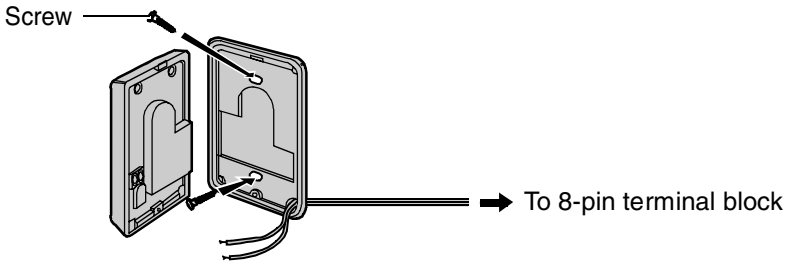



### Installing the Doorphone (KX-T30865)

1. Loosen the screw to separate the doorphone into 2 halves.



**2.** Pass the wires through the hole in the base cover, and attach the base cover to a wall using 2 screws.



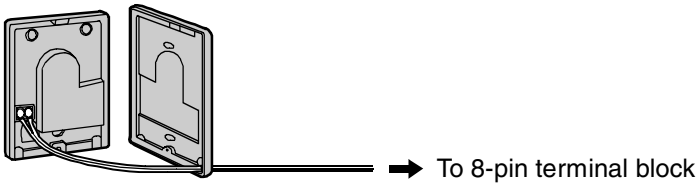

**Note**

Two kinds of screws are included with KX-T30865. Please choose the appropriate kind for your wall type.

: when a doorphone plate has been fixed to the wall

: when you wish to install the doorphone directly to the wall

**3.** Connect the wires to the screws located in the front cover.

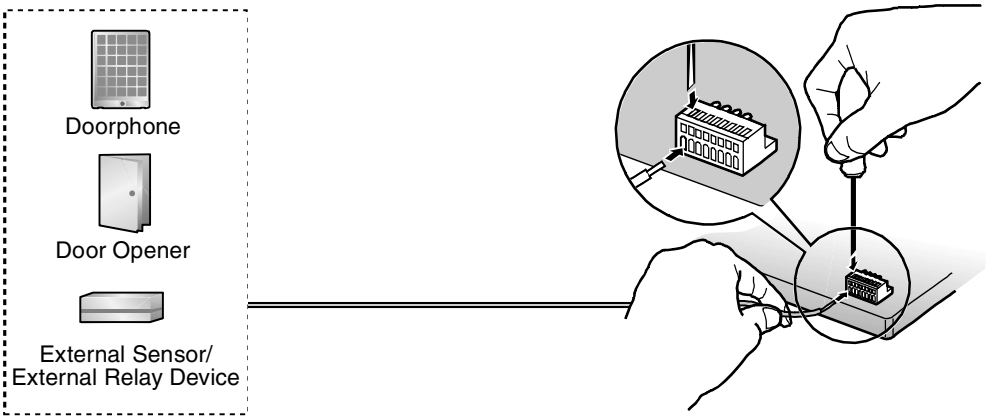



**4.** Re-attach the 2 halves and re-insert the screw.

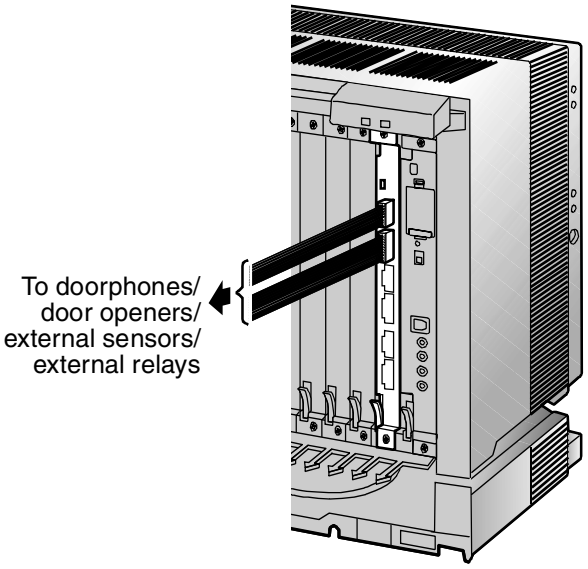
## Connection

Use 8-pin and 10-pin terminal blocks (included with the card) for connection.

**1.** While pressing down on the hole at the top of the terminal block using a screwdriver, insert the wire into the side hole as shown below. Repeat this procedure for other doorphones, door openers, external sensors, and external relays.
Refer to "2.6.2 DPH4 Card" and "2.6.3 EIO4 Card" for pin assignments.

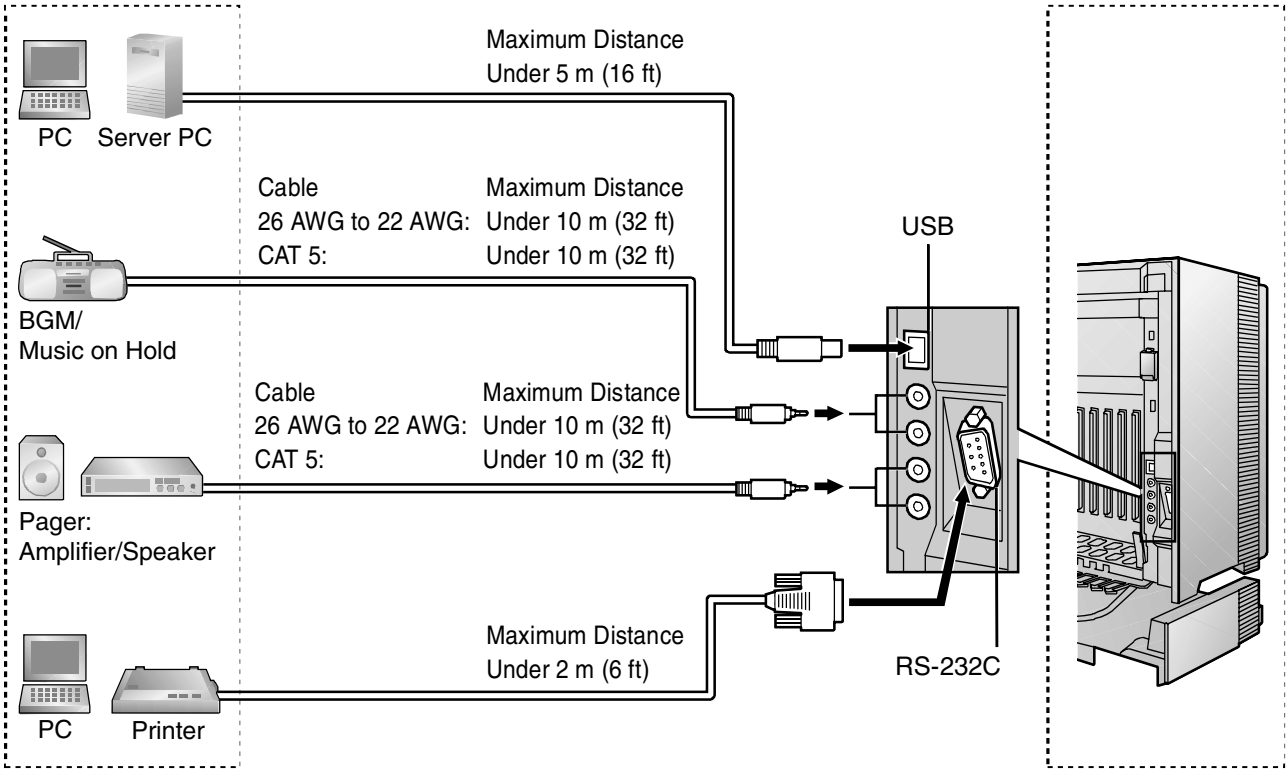


**2.** Attach the terminal blocks to the connectors of the DPH4/EIO4 card on the Hybrid IP-PBX.



# 2.10 Connection of Peripherals

## 2.10.1 Connection of Peripherals




### BGM/MOH

The Hybrid IP-PBX provides Background Music and Music on Hold. Up to 2 external music sources (e.g., user-supplied radios) can be connected to the Hybrid IP-PBX.

**CAUTION**

- Wiring should be done carefully to prevent undue force being exerted on the plug. Otherwise, music may intermittent.
- External Music Jacks are SELV ports and should only be connected to approved SELV devices.

**Note**

When the Hybrid IP-PBX and external music sources are not connected to the same ground, hum noise may be induced into Background Music and Music on Hold.

# Pager

Up to 2 paging devices (user-supplied) can be connected to the Hybrid IP-PBX.

**CAUTION**

External Paging Jacks are SELV ports and should only be connected to approved SELV devices.

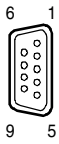
# PC/Printer (via RS-232C)

The Hybrid IP-PBX is equipped with an RS-232C interface. This interface provides communication between the Hybrid IP-PBX and the user-supplied devices such as PC or line printers. The RS-232C port is used for system programming, SMDR, diagnostics and external system database storage (save/load) functions. When using special accessories such as cable, the user should use those specified in this installation manual to comply with the limits for a Class B digital device pursuant to the FCC Rules.

**Note**

Use an RS-232C cross cable for connection between the Hybrid IP-PBX and PC.

## Pin Assignments



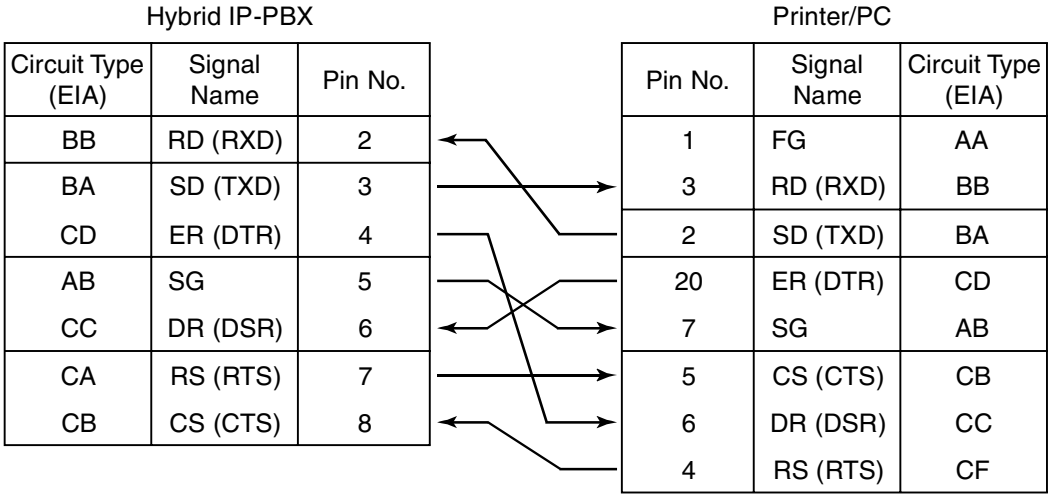

| No. | Signal Name | Function | Circuit Type | |
|---|---|---|---|---|
| | | | EIA | CCITT |
| 2 | RD (RXD) | Receive Data | BB | 104 |
| 3 | SD (TXD) | Transmit Data | BA | 103 |
| 4 | ER (DTR) | Data Terminal Ready | CD | 108.2 |
| 5 | SG | Signal Ground | AB | 102 |
| 6 | DR (DSR) | Data Set Ready | CC | 107 |
| 7 | RS (RTS) | Request To Send | CA | 105 |
| 8 | CS (CTS) | Clear To Send | CB | 106 |

## Connection Charts

**For connecting printer/PC with a 9-pin RS-232C connector**

| Hybrid IP-PBX | | | | Printer/PC | | |
|---|---|---|---|---|---|---|
| Circuit Type (EIA) | Signal Name | Pin No. | | Pin No. | Signal Name | Circuit Type (EIA) |
| BB | RD (RXD) | 2 | ↔ | 2 | RD (RXD) | BB |
| BA | SD (TXD) | 3 | ↔ | 3 | SD (TXD) | BA |
| CD | ER (DTR) | 4 | ↔ | 4 | ER (DTR) | CD |
| AB | SG | 5 | ↔ | 5 | SG | AB |
| CC | DR (DSR) | 6 | ↔ | 6 | DR (DSR) | CC |
| CA | RS (RTS) | 7 | ↔ | 7 | RS (RTS) | CA |
| CB | CS (CTS) | 8 | ↔ | 8 | CS (CTS) | CB |

**For connecting printer/PC with a 25-pin RS-232C connector**



Hybrid IP-PBX

| Circuit Type (EIA) | Signal Name | Pin No. |
|---|---|---|
| BB | RD (RXD) | 2 |
| BA | SD (TXD) | 3 |
| CD | ER (DTR) | 4 |
| AB | SG | 5 |
| CC | DR (DSR) | 6 |
| CA | RS (RTS) | 7 |
| CB | CS (CTS) | 8 |

Printer/PC

| Pin No. | Signal Name | Circuit Type (EIA) |
|---|---|---|
| 1 | FG | AA |
| 3 | RD (RXD) | BB |
| 2 | SD (TXD) | BA |
| 20 | ER (DTR) | CD |
| 7 | SG | AB |
| 5 | CS (CTS) | CB |
| 6 | DR (DSR) | CC |
| 4 | RS (RTS) | CF |

**RS-232C Signals**

- **Receive Data (RXD):**…(input)
  Conveys signals from the printer or the PC.
- **Transmit Data (TXD):**…(output)
  Conveys signals from the unit to the printer or the PC. A "Mark" condition is held unless data or BREAK signals are being transmitted.
- **Data Terminal Ready (DTR):**…(output)
  This signal line is turned ON by the unit to indicate that it is ON LINE. Circuit ER (DTR) ON does not indicate that communication has been established with the printer or the PC. It is switched OFF when the unit is OFF LINE.
- **Signal Ground (SG)**
  Connects to the DC ground of the unit for all interface signals.
- **Data Set Ready (DSR):**…(input)
  An ON condition of circuit DR (DSR) indicates the printer or the PC is ready. Circuit DR (DSR) ON does not indicate that communication has been established with the printer or the PC.
- **Request To Send (RTS):**…(output)
  This lead is held ON whenever DR (DSR) is ON.
- **Clear To Send (CTS):**…(input)
  An ON condition of circuit CS (CTS) indicates that the printer or the PC is ready to receive data from the unit. The unit does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.
- **Frame Ground (FG)**
  Connects to the unit frame and the earth ground conductor of the AC power cord.

# PC/Server PC (via USB version 1.1)

The Hybrid IP-PBX is equipped with a USB interface. This interface provides communication between the Hybrid IP-PBX and a PC or a Server PC.

The PC is used for system programming, diagnostics and external system database storage (save/load) functions.

The Server PC is used for connecting PCs on a LAN to provide third party call control CTI. The CTI connection uses the CSTA Phase 3 protocol.

**Note**

The operating system of the PC or Server PC required for third party call control depends on your CTI application software. For details, refer to the manual for your CTI application software.

## Pin Assignments

| No. | Signal Name |
|---|---|
| 1 | VBUS |
| 2 | USB D- |
| 3 | USB D+ |
| 4 | GND |

# 2.11 Power Failure Connections

## 2.11.1 Power Failure Connections

When the power supply to the Hybrid IP-PBX fails, power failure transfer (PFT) will switch from the current connection to the Power Failure Connection. Refer to "2.4.1 Power Failure Transfer" in the Feature Guide for further information.
Power Failure Connection is required to implement this feature.

### Connection

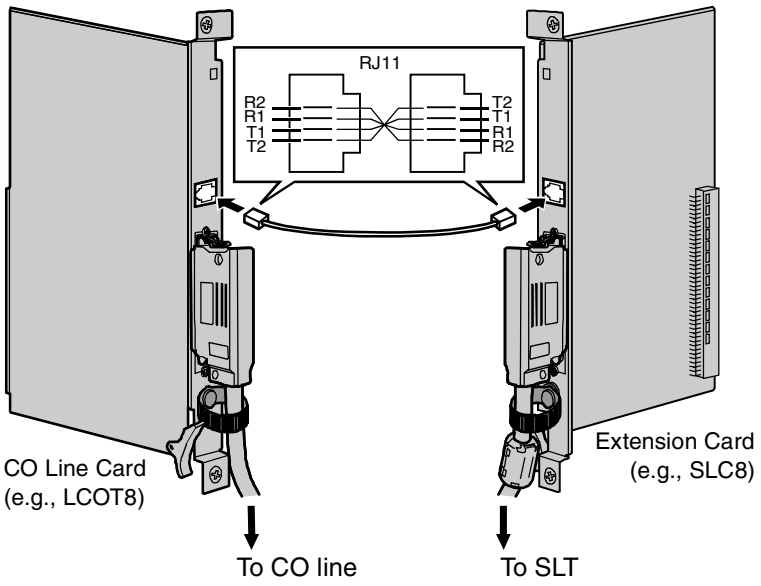
Power Failure Connection connects a specific SLT and a CO line in the event of power failure. The following CO line and extension cards can be used for Power Failure Connections:

- **Analog CO line cards:** LCOT16 (4 PFT ports), and LCOT8 (2 PFT port), port)
- **Extension cards:** MSLC16 (4 PFT ports), SLC16 (4 PFT ports), DHLC8 (2 PFT port) and SLC8 (2 PFT port)

To 1 analog CO line card, connect only 1 extension card.

**Note**

By programming the Hybrid IP-PBX, a CO line conversation established during power failure can be maintained even when the power returns and the connection is switched back to the normal configuration from the Power Failure Connection. However, if no special programming is performed, the connection will be dropped when power returns.



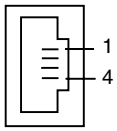

### Accessory and User-supplied Items

**Accessory (included):** none

**User-supplied (not included):** RJ11 connectors

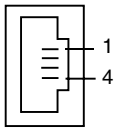
## RJ11 Connector Pin Assignments for CO line Card

### PFT Ports 1 and 2




| No. | Signal Name | Function |
|---|---|---|
| 1 | R2 | Ring port 2 |
| 2 | R1 | Ring port 1 |
| 3 | T1 | Tip port 1 |
| 4 | T2 | Tip port 2 |

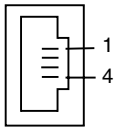
### PFT Ports 3 and 4 (for LCOT16 card only)




| No. | Signal Name | Function |
|---|---|---|
| 1 | R4 | Ring port 4 |
| 2 | R3 | Ring port 3 |
| 3 | T3 | Tip port 3 |
| 4 | T4 | Tip port 4 |

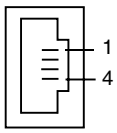
## RJ11 Connector Pin Assignments for Extension Card

### PFT Ports 1 and 2




| No. | Signal Name | Function |
|---|---|---|
| 1 | T2 | Tip port 2 |
| 2 | T1 | Tip port 1 |
| 3 | R1 | Ring port 1 |
| 4 | R2 | Ring port 2 |

### PFT Ports 3 and 4 (for MSLC16/SLC16 card only)




| No. | Signal Name | Function |
|---|---|---|
| 1 | T4 | Tip port 4 |
| 2 | T3 | Tip port 3 |
| 3 | R3 | Ring port 3 |
| 4 | R4 | Ring port 4 |

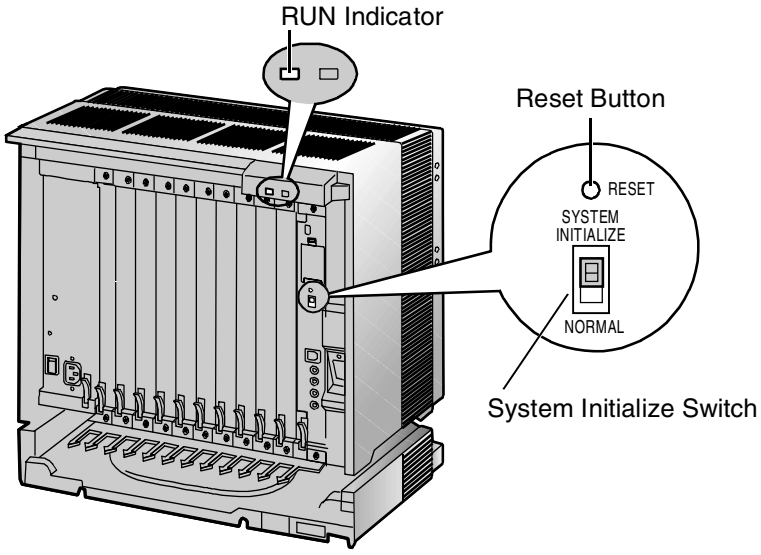
# 2.12 Starting the Hybrid IP-PBX

## 2.12.1 Starting the Hybrid IP-PBX

**CAUTION**

- SD Memory Card must be inserted in the SD Memory Card slot of the MPR card before startup.
- Before touching the System Initialize Switch, discharge static electricity by touching ground or wearing a grounding strap.
- Once you have started the Hybrid IP-PBX and if you unplug the Hybrid IP-PBX, do not perform the following procedures to start the Hybrid IP-PBX again. Otherwise, your programmed data is cleared. To restart the Hybrid IP-PBX, refer to "4.1.4 Using the Reset Button".
- The Hybrid IP-PBX will continue to be powered even if the power switch is turned "OFF".
- The power supply cord is used as the main disconnect device, ensure that the socket-outlet is located/installed near the equipment and is easily accessible.

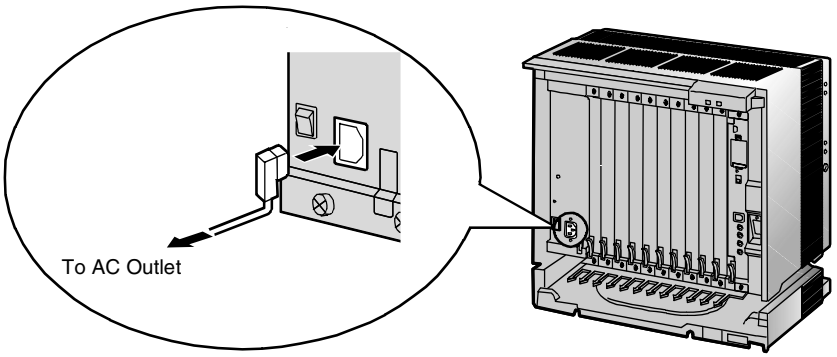
**1.** Set the System Initialize Switch to the "SYSTEM INITIALIZE" position.



2. Plug the AC power cord into the Hybrid IP-PBX and an AC outlet, and turn on the Hybrid IP-PBX. The RUN indicator will flash.

**Note**

For safety reasons, do not stretch, bend, or pinch the AC power cord.




3. While the RUN indicator is flashing, return the System Initialize Switch to the "NORMAL" position. Depending on the configuration, initialization takes about 1 min to 3 min. If successfully executed, the RUN indicator will stop flashing and be kept lit.

All data will be cleared, and the Hybrid IP-PBX as well as all optional service cards (except for the IP-GW card) will be initialized to the default values. The DPTs should show the time as 01:00.
The data of the IP-GW card will not be initialized.

**Note**

Use only the AC power cord included with the PSU.

## LED Indications

| Indication | Color | Description |
|---|---|---|
| RUN | Green | PBX status indication<br>• OFF: Power off (includes normal reset)<br>• ON: Power on and running (on-line)<br>• Flashing (60 times per minute): Starting up<br>• Flashing (120 times per minute): Starting up or resetting with:<br>  • the System Initialize Switch in "SYSTEM INITIALIZE" position<br>  • the SD Memory Card not inserted |
| ALARM | Red | Alarm indication<br>• OFF: Normal<br>• ON: Alarm (CPU stop, alarm for each card)<br>• Flashing: Alarm (MPR file error in restarting) |

## Confirming the CO Line Connection

After initialization, program the Hybrid IP-PBX and establish CO line connection, and then use a PT to confirm it.

To confirm, dial [✳] [3] [7] + CO line number (3 digits) or press an S-CO button. You will hear a dial tone if CO line is available and connected.

# Section 3

# Guide for the KX-TDA Maintenance Console

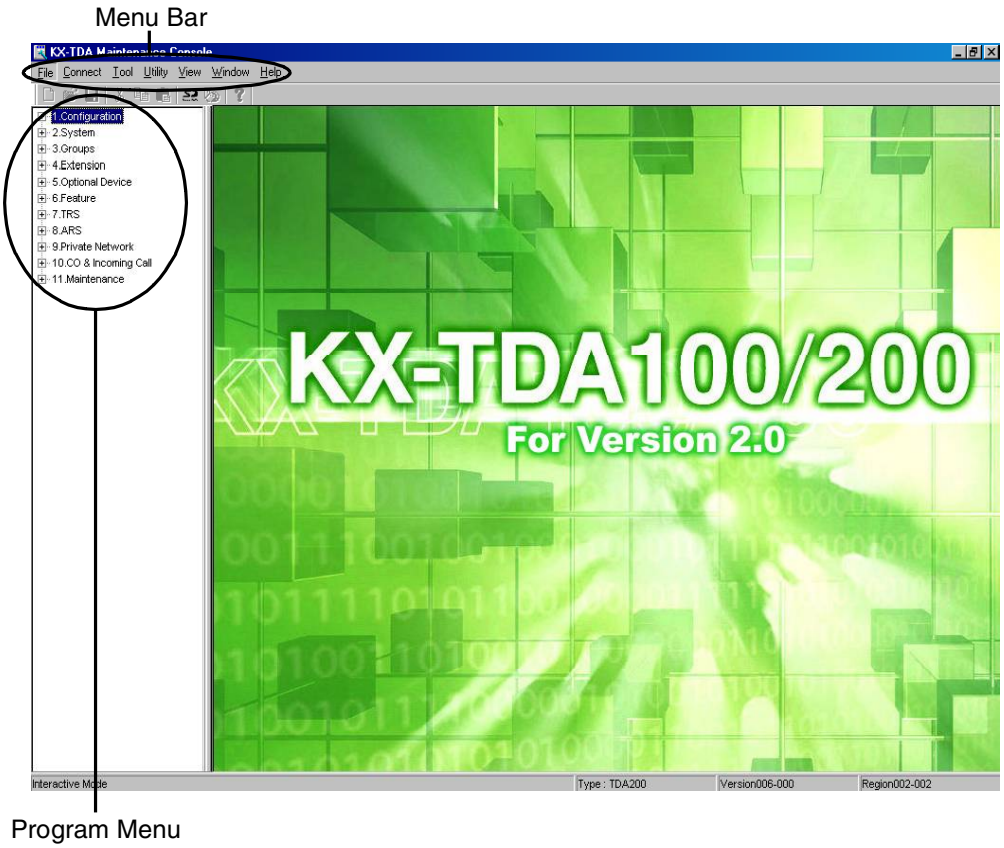
*Explains the installation procedure, structure, and basic information of the KX-TDA Maintenance Console.*

# 3.1 Overview

## 3.1.1 Overview

KX-TDA Maintenance Console is designed to serve as an overall system programming reference for the Hybrid IP-PBX. To program and administer the Hybrid IP-PBX by PC, you need to install the KX-TDA Maintenance Console onto the PC.
This manual describes overview and installation of the KX-TDA Maintenance Console only.

**KX-TDA Maintenance Console**[*1]

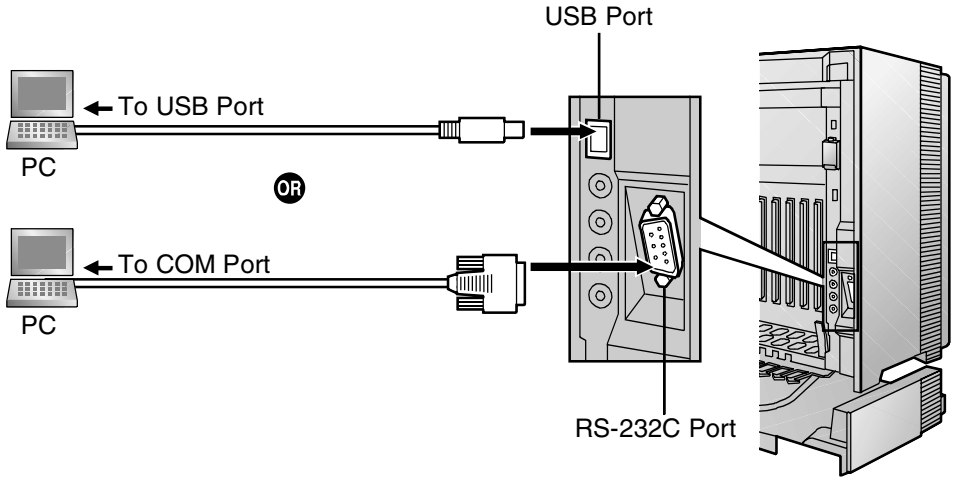



[*1] The contents and design of the software are subject to change without notice.

# 3.2 Connection

## 3.2.1 Connection

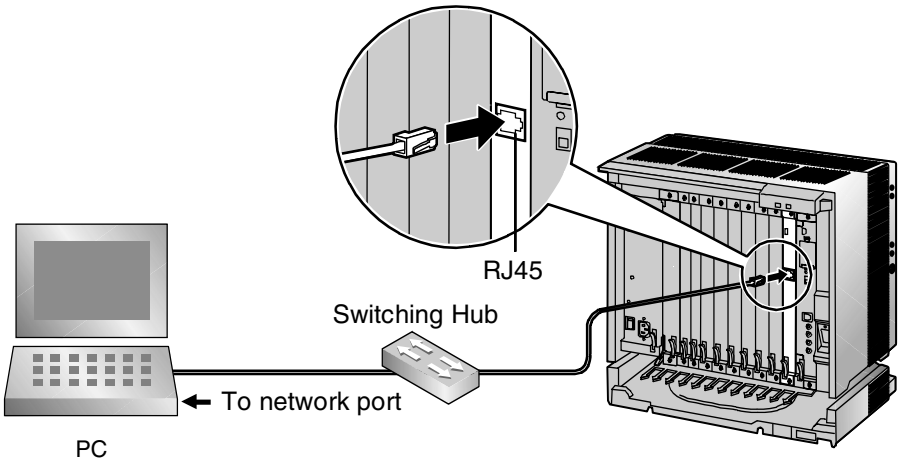
### Serial Interface Connection




**Note**

For pin assignments and maximum cabling distance, refer to "2.10.1 Connection of Peripherals".

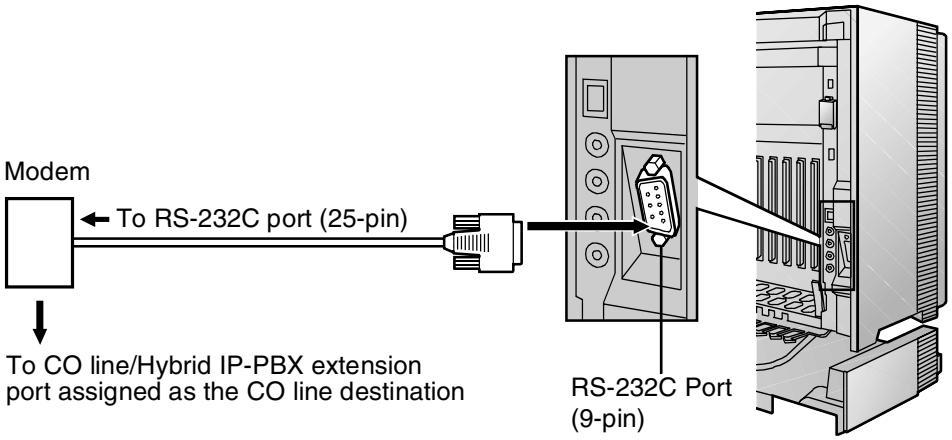
### LAN Connection via CTI-LINK Card




**Note**

For pin assignments and maximum cabling distance, refer to "2.6.6 CTI-LINK Card".

# External Modem Connection




| External Modem | | | Hybrid IP-PBX | |
|---|---|---|---|---|
| Signal Name | Pin No. | | Pin No. | Signal Name |
| SD (TXD) | 2 | → | 2 | RD (RXD) |
| RD (RXD) | 3 | ← | 3 | SD (TXD) |
| DR (DSR) | 6 | → | 4 | ER (DTR) |
| ER (DTR) | 20 | ← | 6 | DR (DSR) |

After connecting the Hybrid IP-PBX and the external modem, set the power switch of the external modem to "ON", then the external modem will be initialized with the default values.

The following AT command settings may be required for the modem:

- The Data Terminal Ready (DTR) signal should be ignored.
- The Data Terminal Equipment (DTE)/Modem flow control should be turned off.
- The data compression should be disabled.
- Error Correction is not necessary.

**Notes**

- Use an RS-232C straight cable for connection between the Hybrid IP-PBX and external modem.
- An AT command (for initialization, enabling automatic answer, etc.) can only be programmed by KX-TDA Maintenance Console. "AT&F0Q0E0V1S0=1X0&D0" is stored as the default value.
- For more information about the AT command, refer to the external modem's instructions.

# 3.3 Installation of the KX-TDA Maintenance Console

## 3.3.1 Installing and Starting the KX-TDA Maintenance Console

### System Requirements

#### Operating System

- Microsoft® Windows® 98 SE, Windows Me, Windows 2000, or Windows XP

#### Hardware

- CPU: Intel® Pentium® 133 MHz or better microprocessor
- RAM: at least 64 megabytes (MB) of free RAM (128 MB recommended)
- HDD: at least 100 MB of hard disc space

### Installing the KX-TDA Maintenance Console

**Notes**

- Make sure to install and use the KX-TDA Maintenance Console for version 2.0.
- To install or uninstall the software on a PC running Windows 2000 Professional or Windows XP Professional, you must be logged in as a user in either the "Administrators" or "Power Users" group.
- When the Hybrid IP-PBX is first connected to the PC via USB, a wizard should appear and ask you to select the appropriate USB driver. Browse for and select the KX-TDA USB driver, which is copied to the local drive during installation.

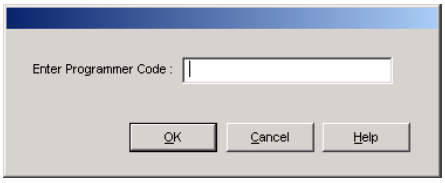
1. Copy the KX-TDA Maintenance Console setup file to a local drive on the PC. (Its icon is shown here, on the left.)
2. Double-click the setup file to run the installer.
3. Follow the on-screen instructions provided by the installation wizard.

## Starting the KX-TDA Maintenance Console and Assigning the Basic Items (Quick Setup)

When you start the KX-TDA Maintenance Console with the Installer Level Programmer Code and connect to the Hybrid IP-PBX for the first time after initialization (with the factory default setting), Quick Setup will launch automatically. During Quick Setup, you will setup the following basic items:

- Date and Time of the Hybrid IP-PBX. The date and time set on the PC will be used.
- System Password for installer for PC programming.
- Operator extension numbers. Operator extensions for all time modes (day/lunch/break/night) can be assigned.
- Flexible Numbering type to pattern 1 or pattern 2. If pattern 1 (with ✳) is selected, "✳" must prefix all feature numbers (except access numbers) when an extension user wants to use a feature.
- Operator call and Idle Line Access/ARS numbers (0 or 9). The feature numbers for operator call and Idle Line Access/ARS can be selected.
- Remote Maintenance Dial Number. Enter the complete telephone number of the Hybrid IP-PBX (including the country code). When necessary, this number will be used to access the Hybrid IP-PBX from a remote location for maintenance purposes.

1. Connect the PC to the Hybrid IP-PBX with a USB cable.
2. Start the **KX-TDA Maintenance Console** from the Start menu.



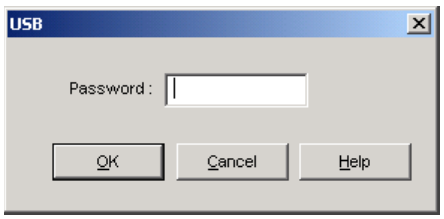

3. Type the Installer Level Programmer Code (default: **INSTALLER**), then click [OK].

   The Programmer Code authorizes different programming levels, and the Quick Setup is only available when you start the KX-TDA Maintenance Console with the Installer Level Programmer Code.

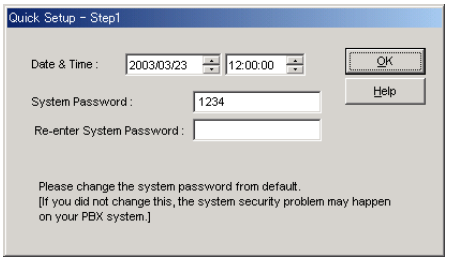
   **Note**

   There are 2 other Programmer Codes with limited authorization: Administrator Level (default: **ADMIN**), and User Level (default: **USER**).

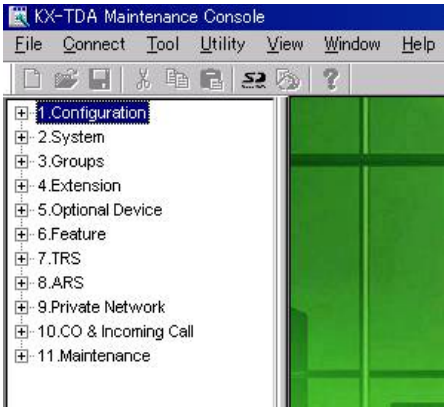
4. Click "**Connect**" → "**USB**" from the menu bar.




**5.** Type the system password for installer (default: **1234**), then click [OK] to log-in.




**6.** Follow the instructions of the wizard and assign the basic items (Quick Setup).




**7.** The program menu appears. You may now begin programming the Hybrid IP-PBX.

**Notes**

- During long programming sessions, it is highly recommended that you periodically save the system data to the SD Memory Card. If the Hybrid IP-PBX suffers a sudden power failure or if the system is reset for some reason and all system data is lost, it can be restored from the SD Memory Card. To save the system data to the SD Memory Card, either click the "**SD Memory Backup**" icon, or exit KX-TDA Maintenance Console and click "Yes" to save when prompted.
- When programming Hybrid IP-PBX data which can be displayed on a proprietary telephone (PT) (extension names, group names, System Speed Dialing names, etc.), it is possible to enter characters which cannot be displayed on a KX-T7600 series PT.
  Characters which can be displayed on a KX-T7600 series PT are shown below in the white cells.

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0a | 0b | 0c | 0d | 0e | 0f |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |
| 20 | | ! | " | # | $ | % | & | ' | ( | ) | * | + | , | - | . | / |
| 30 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 40 | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 50 | P | Q | R | S | T | U | V | W | X | Y | Z | [ | \ | ] | ^ | _ |
| 60 | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 70 | p | q | r | s | t | u | v | w | x | y | z | { | \| | } | ~ | |
| 80 | € | | ‚ | ƒ | „ | … | † | ‡ | ˆ | ‰ | Š | ‹ | Œ | | Ž | |
| 90 | | ‘ | ’ | “ | ” | • | – | — | ˜ | ™ | š | › | œ | | ž | Ÿ |
| a0 | | ¡ | ¢ | £ | ¤ | ¥ | ¦ | § | ¨ | © | ª | « | ¬ | | ® | ¯ |
| b0 | ° | ± | ² | ³ | ´ | µ | ¶ | · | ¸ | ¹ | º | » | ¼ | ½ | ¾ | ¿ |
| c0 | À | Á | Â | Ã | Ä | Å | Æ | Ç | È | É | Ê | Ë | Ì | Í | Î | Ï |
| d0 | Ð | Ñ | Ò | Ó | Ô | Õ | Ö | × | Ø | Ù | Ú | Û | Ü | Ý | Þ | ß |
| e0 | à | á | â | ã | ä | å | æ | ç | è | é | ê | ë | ì | í | î | ï |
| f0 | ð | ñ | ò | ó | ô | õ | ö | ÷ | ø | ù | ú | û | ü | ý | þ | ÿ |

- The PC will not perform any shutdown operation, or enter the power-saving system standby mode while the KX-TDA Maintenance Console is connected to the Hybrid IP-PBX. To perform either of the operations above, first close the connection to the Hybrid IP-PBX.

**CAUTION**

Do not remove the SD Memory Card while power is supplied to the Hybrid IP-PBX. Doing so may cause the Hybrid IP-PBX to fail to start when you try to restart the system.

# Section 4
# Troubleshooting

*This section provides information on the Hybrid IP-PBX and telephone troubleshooting.*

# 4.1 Troubleshooting

## 4.1.1 Installation

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|---|---|
| Extension does not operate. | Bad extension card. | • Exchange the card for a known working one. |
| | Bad connection between the Hybrid IP-PBX and telephone. | • Take the telephone and plug it into the same extension port using a short telephone cord. If the telephone works, then the connection between the Hybrid IP-PBX and the telephone must be repaired. |
| | A telephone with an A-A1 relay is connected. | • Use a 2-wire cord.<br>• Set the A-A1 relay switch of the telephone to the "OUT" or "OFF" position. |
| | Bad telephone. | • Take the telephone and plug it into another extension port that is working. If the telephone does not work, replace the telephone. |
| | Wrong type of PSU. | • Replace the PSU with the appropriate type. |
| The Hybrid IP-PBX does not operate properly. | | • Press the Reset Button (refer to "4.1.4 Using the Reset Button").<br>• Turn off the power switch, and then turn it back on.<br>• Turn off the power switch, and then unplug the Hybrid IP-PBX. After 5 minutes, plug the Hybrid IP-PBX back in, and turn the power switch back on. |
| Noise on external paging. | Induced noise on the wire between the Hybrid IP-PBX and the amplifier. | • Use a shielded cable as the connection wire between the Hybrid IP-PBX and amplifier. A short shielded cable is recommended. |
| Distorted external music. | Excessive input level from external music source. | • Decrease the output level of the external music source by using the volume control on the music source. |
| Alternate Calling—Ring/Voice and Live Call Screening (LCS) do not function as set when using a Wireless Phone (KX-T7880/ KX-T7885/KX-TD7894/KX-TD7895). | Voice-calling mode and Hands-free mode with LCS are not available with Wireless Phones. | • Switch the calling mode to ring-calling.<br>• Set the LCS mode to "Private". |

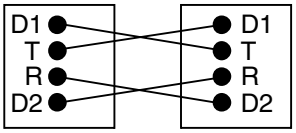
| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|---|---|
| The ALARM indicator on the front of the cabinet turns on red. | A major system error occurs in the Hybrid IP-PBX. | • See the error log using the KX-TDA Maintenance Console (refer to "4.1.5 Troubleshooting by Error Log"). |

## 4.1.2 Connection

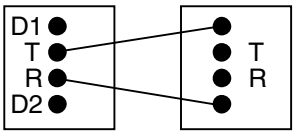
Can you dial an extension?

No

Connection between the Hybrid IP-PBX and a PT:

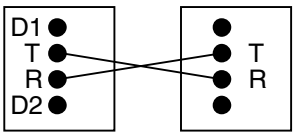
| CAUSE | SOLUTION |
|---|---|
| The T/R is connected to the D1/D2.<br>  <br> | Use the correct cord (the inner 2 wires are for T/R and the outer 2 wires are for D1/D2). |

Connection between the Hybrid IP-PBX and an SLT:

| CAUSE | SOLUTION |
|---|---|
| The T/R is connected to the D1/D2.<br>  <br> | Use the correct cord (the inner 2 wires are for T/R).<br>• If a telephone equipped with an A-A1 relay is connected to the Hybrid IP-PBX, set the A-A1 relay switch of the telephone to "OFF". |

Yes

Connection between the Hybrid IP-PBX and an SLT that is polarity-sensitive:

| CAUSE | SOLUTION |
|---|---|
| The "T" is connected to the "R".<br>  <br> | Reverse the connections of the T/R. |

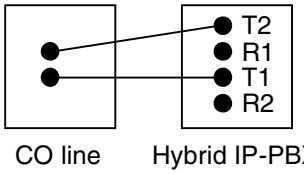
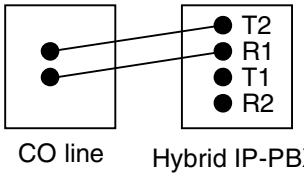
(Continued on the next page.)

(Continued from the previous page.)

Can you dial out on a CO line?

No

Connection between the central office and the Hybrid IP-PBX:

| CAUSE | SOLUTION |
|---|---|
| CO line is connected to the T2/T1.<br>  <br><br>CO line is connected to the T2/R1.<br>  <br> | Reconnect the CO line to the T1/R1 or T2/R2 of the telephone jack using 2-conductor wiring. |

## 4.1.3 Operation

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|---|---|
| • When using the speakerphone on an APT, nothing is audible.<br>• When using the speakerphone/monitor mode with a DPT, nothing is audible. | • The HANDSET/HEADSET selector is set to the "HEADSET" position.<br>• The "HEADSET" mode is selected by Personal Programming, "Handset/ Headset Selection". | • When the headset is not used, set the HANDSET/HEADSET selector to the "HANDSET" position.<br>• When the headset is not used, select the "HANDSET" mode by Personal Programming. |
| • The PT does not ring. | • The ringer volume is off. | • Turn on the ringer volume. |
| • During a power failure, extensions connected to ports 1 to 4 of MSLC16/ SLC16 and ports 1 to 2 of DHLC8/SLC8 cards do not operate. | • A DPT or APT is connected to the extension port.<br>• The dialing mode (tone or pulse) is incorrect. | • Disconnect the DPT or APT and connect an SLT.<br>• Set the Tone/Pulse switch to the other position. |
| • Originating an outside call, call transfer, or conference cannot be performed. | • The corresponding CO button does not exist on the PT. | • Program the CO button. Refer to "1.18.2 Flexible Buttons" in the Feature Guide. |
| • Cannot register the PS. | • Wrong Personal Identification Number (PIN) is registered to the PS.<br>• CS is not connected properly. | • Register the PIN set to the Hybrid IP-PBX into the PS.<br>• Make sure that the cable is connected properly with correct pin assignments. Also, make sure that the cable does not make short circuits.<br>• Switch all DIP switches off. |
| • PS becomes out of range.<br>• Cannot make calls using the PS. | • CSIF card is not working.<br>• CS is not working.<br>• Location of CS is not good.<br>• Access system of the PS is not properly set. | • Install the CSIF card properly.<br>• Make sure that the cable is connected properly with correct pin assignments. Also, make sure that the cable does not make short circuits.<br>• Switch all DIP switches off.<br>• Locate the CS properly (refer to "2.8.5 Site Survey" ).<br>• Change the access system setting of the PS to the appropriate system or automatic. |
| • Noise is frequent while using the PS.<br>• Conversations disconnect while using the PS. | • Call handover is not working while using the PS.<br>• PS is out of CS coverage area. | • Locate the CS properly (refer to "2.8.5 Site Survey" ). |

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|---|---|
| • PS stays out of service when the CS status is changed from Out of Service to In Service. | • It may take about 20 s for CS to startup after the status has been changed to In Service. | • Wait until the CS starts up. |

# 4.1.4 Using the Reset Button

If the Hybrid IP-PBX does not operate properly, use the Reset Button. Before using the Reset Button, try the system feature again to confirm whether there definitely is a problem or not.

**CAUTION**

In order to avoid possible corruption of data on the SD Memory Card, please ensure that the "SD ACCESS" LED is off before pressing the Reset Button.

**Notes**

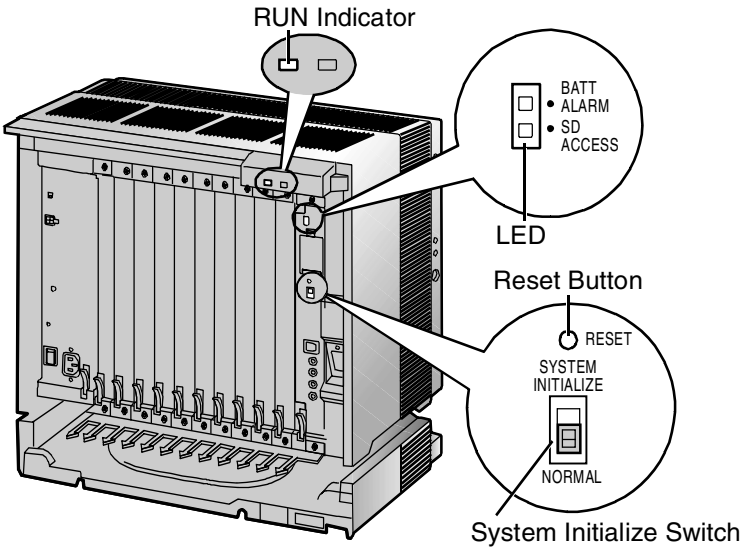
- When the System Initialize Switch is set to "NORMAL", pressing the Reset Button causes the following:
  - Camp-on is cleared.
  - Calls on hold are terminated.
  - Calls on exclusive hold are terminated.
  - Calls in progress are terminated.
  - Call park is cleared.

  Other data stored in memory, except the above, are not cleared.
- When the Reset Button is pressed with the System Initialize Switch in the "SYSTEM INITIALIZE" position, all data stored in memory are cleared.

## Operation

If the Hybrid IP-PBX does not operate properly:

1. Set the System Initialize Switch to the "NORMAL" position.
2. Press the Reset Button.



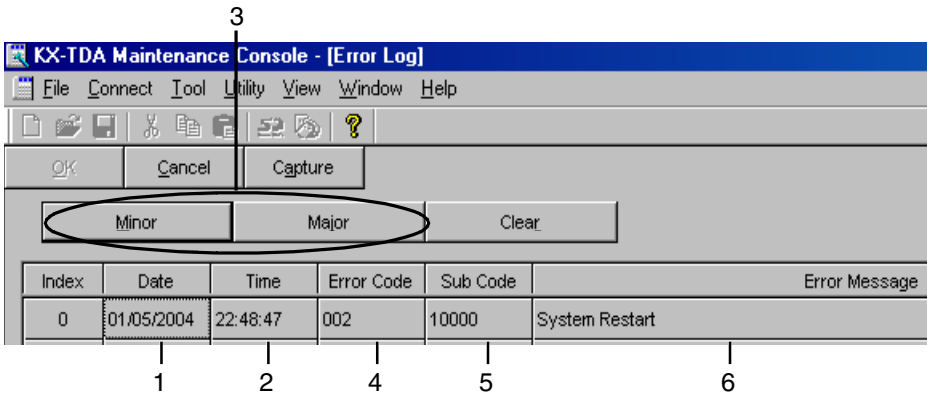
# 4.1.5 Troubleshooting by Error Log

When a major system error occurs in the Hybrid IP-PBX, the ALARM indicator on the front of the cabinet turns on red, and the system logs the error information.

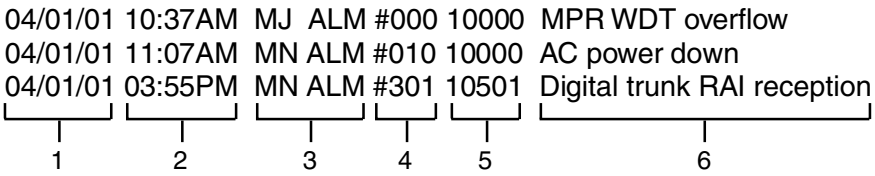
## Error Log Display Format

Below is the display format of the error log. To see the error log using the KX-TDA Maintenance Console, refer to the on-line help of the KX-TDA Maintenance Console.

**Example: KX-TDA Maintenance Console**




**Example: Station Message Detail Recording (SMDR)**




### Description

| | Item | Description |
|---|---|---|
| 1 | Date | Date of the error detection |
| 2 | Time | Time of the error detection |
| 3 | Level | Major Alarm (MJ ALM):<br>Errors that affect the whole system operation, or result in system failure<br>Minor Alarm (MN ALM):<br>Errors that affect certain part of system operation |
| 4 | Error Code | Three-digit error code |

| | Item | Description |
|---|---|---|
| 5 | Sub Code | Five-digit sub code (1XXYY)<br>1: Cabinet number<br>XX: Slot number<br>KX-TDA100: 00 to 06 (00: MPR slot; 01 to 05: Free slot; 06: Option slot)<br>KX-TDA200: 00 to 11 (00: MPR slot; 01 to 10: Free slot; 11: Option slot)<br>YY: Physical port number (01 to 16)<br>For OPB3 card, sub slot number + port number will be displayed.<br>Sub slot 1: 11 to 14<br>Sub slot 2: 21 to 24<br>Sub slot 3: 31 to 34<br>**Note**<br>When there is no parameter for slot and physical port number, XX and YY will be displayed as "00".<br>Example: Sub code for MPR card = 10000 |
| 6 | Error Message | Error description |

## List of Errors and Solutions

The tables below list the errors and their solutions.

When an error whose error code is indicated with "*" occurs in the Hybrid IP-PBX, the ALARM indicator on the front of the cabinet turns on red, and the system logs the error information.

When the error conditions indicated by the error codes "021", "091", "092", "230", and "510" are recovered, the ALARM indicator will turn off automatically, indicating successful troubleshooting. When other errors are logged, the ALARM indicator will turn off only when the log for major or minor errors is cleared from the KX-TDA Maintenance Console.

In other words, the ALARM indicator will turn off under the following conditions:

- **When the errors "021", "091", "092", "230", and "510" are logged:** when the error conditions are recovered
- **When other errors are logged:** when the log for major or minor errors is cleared from the KX-TDA Maintenance Console

### LPR (Optional Service Card with Local Processor) Initial Self Diagnosis

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 211 | Speech path loop-back check error | • Optional service card malfunction: DHLC, DLC, SLC, CSIF, LCOT, T1, PRI, OPB3, IP-GW | • See if the corresponding optional service card is installed properly<br>• Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Replace the corresponding optional service card |
| 212 | Echo canceller access error | • Optional service card malfunction: CSIF, ECHO | |
| 214 | DSP Boot check error | • Optional service card malfunction: T1 | |
| 215 | Framer IC access error | • Optional service card malfunction: T1, PRI | |
| 216 | MSG card DSP error | • Optional service card malfunction: MSG, OPB3 | |
| 217 | MSG card data error | • Optional service card malfunction: MSG, OPB3<br>• Erroneous recording of messages | • See if the corresponding optional service card is installed properly<br>• Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Re-record the messages<br>• Replace the corresponding optional service card |

### System Start-up and On-line Operation

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 000* | MPR WDT overflow | • MPR card malfunction<br>• Optional service card malfunction: CTI-LINK<br>• Erroneous processing of MPR card software<br>• Software error due to external factors | • Press the Reset Button<br>• Reprogram the Hybrid IP-PBX<br>• Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 001 | SDRAM bit error | | |
| 002 | System Reset | • Reset Button is pressed<br>• Power failure<br>• MPR card malfunction<br>• Erroneous processing of MPR card software<br>• Software error due to external factors | • Ignore if not frequent<br>• Press the Reset Button<br>• Reprogram the Hybrid IP-PBX<br>• Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 010* | AC power down | • Power supply system malfunction (e.g., power failure, power noise, trouble with UPS)<br>• Bad connection or breaking of AC cord<br>• Power supply circuit (PSU, back board) malfunction | • Check the power supply system<br>• See if the AC cord is connected properly<br>• Check the AC cord<br>• Replace the AC cord (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Replace the PSU (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Replace the back board (be sure to turn off the Hybrid IP-PBX when replacing) |
| 011* | DC power down | • AC power down<br>• Power supply circuit (PSU, back board) malfunction<br>• Detection of over current (short circuit on optional service cards) | • Check the power supply system<br>• See if the AC cord is connected properly<br>• Check the AC cord<br>• Replace the AC cord (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Replace the PSU (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Replace the back board (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Remove the optional service cards and restart the Hybrid IP-PBX |
| 012* | MPR RAM battery low | • Battery out<br>• MPR card malfunction | • Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 014* | FAN Alarm | • PSU-L malfunction | • See if anything is jammed in the fan<br>• Replace the PSU (be sure to turn off the Hybrid IP-PBX when replacing) |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 016 | CS overload | • Defective cable<br>• CS malfunction<br>• Optional service card malfunction: CSIF | • Check the cable diameter and length<br>• Replace the CS<br>• Replace the corresponding optional service card |
| 020* | SD file access error | • SD Memory Card malfunction<br>• Bad connection of SD Memory Card<br>• MPR card malfunction | • Press the Reset Button<br>• Reprogram the Hybrid IP-PBX<br>• Replace the SD Memory Card<br>• Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 021* | SD Memory Card disconnected | • SD Memory Card not installed<br>• Bad connection of SD Memory Card<br>• SD Memory Card malfunction<br>• MPR card malfunction | |
| 022 | Not enough free space on SD card | • Not enough memory space available to save the system data, or to upload system files from the KX-TDA Maintenance Console | • Delete the files whose file names start with "$" from SD Memory Card<br>• Delete the "Pxxx" files (old program files of optional service cards) from SD Memory Card. "xxx" indicates the card type (e.g., "PDHLC" for DHLC card)<br>**Note**<br>Do not delete the "PMPR" file; it is the program file of the MPR card. |
| 023 | System data file version error | • Old system files on SD Memory Card<br>• Defective system files on SD Memory Card | • Restore the backup files<br>• Re-install the software |
| 024 | System initialization file version error | | |
| 025 | Card initialization file version error | | |
| 026 | LCD file version error | | |
| 027 | System data file checksum error | | |
| 028 | System initialization file checksum error | | |
| 029 | Card initialization file checksum error | | |
| 030 | LCD file checksum error | | |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 031* | System data file not found | • SD Memory Card not installed<br>• Bad connection of SD Memory Card<br>• SD Memory Card malfunction<br>• MPR card malfunction | • Press the Reset Button<br>• Reprogram the Hybrid IP-PBX<br>• Replace the SD Memory Card<br>• Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 032* | System initialization file not found | | |
| 033* | Card initialization file not found | | |
| 034* | LCD file not found | | |
| 035 | System data file access error | | |
| 036* | System initialization file access error | | |
| 037* | Card initialization file access error | | |
| 038* | LCD file access error | | |
| 039* | SD file access error | | |
| 041* | Expansion Memory Card Failure | | |
| 090 | Over Card Limitation | • Too many optional service cards installed | • Reduce the number of optional service cards |
| 091* | PT connection over | • Too many PTs connected | • Reduce the number of PTs |
| 092* | CS connection over | • Too many CSs connected | • Reduce the number of CSs |
| 200 | LPR start up error (ROM NG) | • Optional service card malfunction: DHLC, DLC, CSIF, T1, PRI, OPB3, CTI-LINK, IP-GW, SLC8 | • Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Replace the corresponding optional service card |
| 201* | LPR start up error (RAM NG) | | |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 202* | LPR start up error (No Program) | • Optional service card malfunction: DHLC, DLC, CSIF, T1, PRI, OPB3, CTI-LINK, IP-GW, SLC8 | • Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Update the software of the corresponding optional service card<br>• Replace the corresponding optional service card |
| 203* | LPR start up error (Version NG) | | |
| 204* | LPR start up error (Download NG) | | |
| 205* | LPR start up error (No response) | | |
| 206 | LPR start up error (Card type NG) | | |
| 207 | LPR start up error (Check SUM NG) | | |
| 230* | Card disconnected | • Optional service card not installed properly<br>• Optional service card malfunction<br>• Back board malfunction | • See if the corresponding optional service card is installed properly<br>• Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Replace the corresponding optional service card<br>• Replace the back board (be sure to turn off the Hybrid IP-PBX when replacing) |
| 231 | LPR alive check error | • Optional service card malfunction: DHLC, DLC, CSIF, T1, PRI, OPB3, CTI-LINK, IP-GW, SLC8<br>• Back board malfunction<br>• MPR card malfunction | • See if the corresponding optional service card is installed properly<br>• Pull out and re-insert the corresponding optional service card<br>• Press the Reset Button<br>• Replace the corresponding optional service card<br>• Replace the back board (be sure to turn off the Hybrid IP-PBX when replacing)<br>• Replace the MPR card (be sure to turn off the Hybrid IP-PBX when replacing) |
| 232 | MPR-LPR communication error | | |
| 233 | LPR data check error | | |
| 234 | DPLL clock failure | | |
| 235* | CS clock failure | • Optional service card malfunction: CSIF | • Replace the corresponding optional service card |
| 250* | T1 DSP failure | • Optional service card malfunction: T1 | • See if the corresponding optional service card is installed properly<br>• Replace the corresponding optional service card |
| 251 | MSG DSP failure | • Optional service card malfunction: MSG | |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 300* | Digital trunk out of synchronization | • Network (digital CO line) malfunction<br>• Optional service card malfunction: PRI, T1<br>• Wrong A/B switch setting: PRI, T1 | • Check the signals from the network<br>• Check the cable<br>• See if the A/B switch is set to A on the corresponding optional service card<br>• See if the corresponding optional service card is installed properly<br>• Replace the corresponding optional service card |
| 301* | Digital trunk RAI reception | | |
| 302* | Digital trunk AIS reception | | |
| 303* | Multiframe out of synchronization | | |
| 304* | Frame error | | |
| 305* | Data Link failure | • Data link between the CS and CSIF card or DHLC/DLC card failed<br>• Data link between the network and PRI card failed<br>• Data link between the network and IP-GW card failed | • Check the connection between the CS and CSIF card or DHLC/DLC card<br>• Check the connection between the network and PRI card<br>• Check the connection between the network and IP-GW card |
| 307 | LAN No Carrier | • IP-GW card not connected to the LAN | • Check the connection between the LAN and IP-GW card |
| 308 | IP-GW LAN Loop back Error | • Detection of IP-GW LAN Loop back Test error | • Replace the corresponding optional service card<br>• Collect the log data of IP-GW (refer to the documentation for the IP-GW card) |
| 309 | IP-GW Core Data Link Error | • Detection of IP-GW Core data Link error | • Press the Reset Button<br>• Collect the log data of IP-GW (refer to the documentation for the IP-GW card) |
| 310* | Port Link Failure | • Voice Processing System malfunction<br>• Ports defective on optional service card: DHLC, DLC | • Check the Voice Processing System<br>• See if the corresponding optional service card is installed properly<br>• Replace the corresponding optional service card |
| 320 | IP-GW H.323 Dummy Call Test Error | • Detection of IP-GW H.323 Dummy Call Test error | • Replace the corresponding optional service card<br>• Collect the log data of IP-GW (refer to the documentation for the IP-GW card) |
| 321 | IP-GW Gatekeeper Error | • Detection of Gatekeeper access error | • Check the IP address setting of the Gatekeeper<br>• Check whether the Gatekeeper is connected to the network and work properly<br>• Check the route to the Gatekeeper |
| 322 | IP-GW Gatekeeper Registration Error | • Gatekeeper Registration is failed | • Check the Gatekeeper setting |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 323 | IP-GW SDRAM Failure | • Detection of IP-GW SDRAM error | • Replace the corresponding optional service card |
| 324 | IP-GW DPRAM Failure | • Detection of IP-GW DPRAM error | • Replace the corresponding optional service card |
| 325 | IP-GW LAN Chip Failure | • Detection of IP-GW LAN Chip failure | • Replace the corresponding optional service card<br>• Collect the log data of IP-GW (refer to the documentation for the IP-GW card) |
| 326 | IP-GW Stop | • IP-GW is stopped from a remote maintenance PC | • This information is logged when IP-GW is stopped from a remote maintenance PC |
| 350 | IP-unit SDRAM bit error | • Optional service card malfunction: IP-EXT | • The IP-EXT card will be rebooted automatically if the error is temporary<br>• Replace the corresponding IP-EXT card if the card is not started up correctly |
| 351 | IP-unit download data check-sum error | | |
| 352 | IP-unit DSP failure | • Optional service card malfunction: IP-EXT | • Replace the corresponding optional service card |
| 353 | IP-PT DSP failure | • IP-PT malfunction | • The IP-PT will be rebooted automatically if the error is temporary<br>• Replace the corresponding IP-PT if the IP-PT is not started up correctly |
| 355 | IP-unit alive check error | • Optional service card malfunction: IP-EXT | • The IP-EXT card will be rebooted automatically if the error is temporary<br>• Replace the corresponding IP-EXT card if the card is not started up correctly |
| 356 | IP/TEL-unit communication error | | |
| 357 | IP-unit FLASH access error | • Optional service card malfunction: IP-EXT | • Replace the corresponding optional service card |
| 358 | IP-unit boot error | | |
| 359 | IP-unit DSP failure (boot diagnosis) | | |
| 360 | IP-PT SUB-CPU failure | • IP-PT malfunction | • The IP-PT will be rebooted automatically if the error is temporary<br>• Replace the corresponding IP-PT if the IP-PT is not started up correctly |
| 361 | IP-PT DHCP server no response | • DHCP server is not active<br>• Network malfunction | • Consult your network administrator |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 362 | IP-PT Rebooted (cause DHCP server) | • DHCP server is not active<br>• Network malfunction<br>• Network configuration has been changed | • Consult your network administrator |
| 370 | IP-GW Rebooted by Maintenance Console | • IP-GW is rebooted from a remote maintenance PC | • This information is logged when IP-GW is rebooted from a remote maintenance PC |
| 371 | IP-GW Rebooted | • Optional service card malfunction: IP-GW | • Check whether the software version of the IP-GW card is correct<br>• Replace the corresponding optional service card |
| 372 | NDSS message over IPGW notification - caused by IPGW Tx resource limitation | • Optional service card malfunction: IP-GW | • Ignore if not frequent<br>• Change the IP-GW card status to Out of Service, and then back to In Service |
| 373 | NDSS message over IPGW notification - caused by IPGW Rx resource limitation | | |
| 374 | NDSS message over IPGW notification - caused by shortage of IPGW resource | | |
| 375 | NDSS message over IPGW notification - caused by Network side | • Network malfunction | • Ignore if not frequent<br>• Consult your network administrator |
| 390 | Digital signal synchronization established | • Synchronization of digital line established or restored | • This information is logged when synchronization of digital line is established, and does not indicate an error condition that needs to be solved |

| Error Code | Error Message | PROBABLE CAUSE | SOLUTION |
|---|---|---|---|
| 391 | Data Link established | • Connection with PC Phone/ PC Console or Voice Processing System (DPT Integration) established or restored | • This information is logged when connection with PC Phone/PC Console or Voice Processing System (DPT Integration) is established, and does not indicate an error condition that needs to be solved. However, if this is logged frequently (with "305 Data Link failure"), check the connection as it may not be done properly. |
| 392 | Clock master card selected | • Clock master card has been changed to the one indicated by the sub code | • Check if the proper card is selected as the new clock master card |
| 393 | LAN Carrier detected | • IP-GW card connected to the LAN | • This information is logged when synchronization of LAN is established |
| 394 | IP-GW Core Data Link established | • IP-GW Core Data Link established | • This information is logged when IP-GW Core Data Link is recovered |
| 395 | IP-GW Gatekeeper Error Cleared | • Connection to the Gatekeeper is recovered | • This information is logged when connection to the Gatekeeper is recovered |
| 396 | IP-GW Run | • IP-GW is started from a remote maintenance PC | • This information is logged when IP-GW is started from a remote maintenance PC |
| 510* | SMDR disconnect | • RS-232C cable not connected<br>• Breaking of RS-232C cable<br>• Printer (terminal equipment) malfunction | • Check the RS-232C cable<br>• Check the terminal equipment |

# Section 5
# Appendix

# 5.1 Revision History

## 5.1.1 Version 1.1

### New Options

- System Components Table
  - KX-TDA0105 Memory Expansion Card (MEC)
  - KX-TDA0484 4-Channel VoIP Gateway Card (IP-GW4E)
  - KX-TDA0143 4 Cell Station Interface Card (CSIF4)
  - KX-T0141 2-Channel Cell Station Unit Using DHLC/DLC Card (PT-interface CS) for 2.4 GHz Portable Station

### New Contents

- 2.7.3 Digital EXtra Device Port (Digital XDP) Connection

### Changed Contents

- 1.4.3 System Capacity

## 5.1.2 Version 2.0

### New Options

- System Components Table
  - KX-TDA0490 16-Channel VoIP Gateway Card (IP-GW16)
  - KX-TDA0470 16-Channel VoIP Extension Card (IP-EXT16)
  - KX-TDA0164 4-Port External Input/Output Card (EIO4)
  - KX-TDA0168 Extension Caller ID Card (EXT-CID)
  - KX-TDA0920 SD Memory Card for Software Upgrade to Enhanced Version

### Changed Contents

- 1.4.3 System Capacity
- 2.9.1 Connection of Doorphones, Door Openers, External Sensors, and External Relays

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